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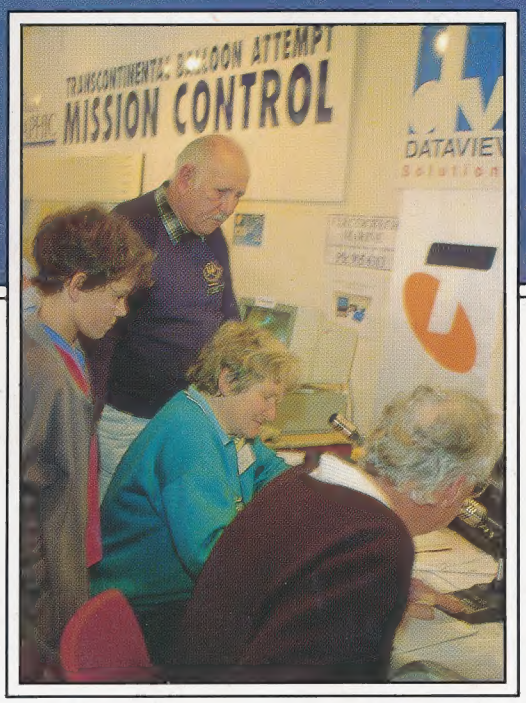

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Cover

Main picture: Dick's balloon photographed over Cobar, NSW. Dick carried his Yaesu HF rig aboard the gondola.

Inset: A youthful observer takes in the wonder of amateur radio at mission control for the Transcontinental Balloon Crossing at Australian Geographic's Terrey Hills, Sydney, headquarters. Jo Harris VK2KAA operating, Stephen Pall VK2PS (standing) looking on.

(Pictures courtesy Australian Geographic)

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

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FEDERAL QSP

It's amazing how time flies and the time has come around again to put fingers to the keyboard and write another Federal QSP column. By the time you read this another quarterly meeting of the Federal Council will have been held in Melbourne. These meetings bring the Council together regularly on a myriad of matters pertaining to our hobby which require the Council's consideration. At the Divisional level the Divisional Council meets regularly considering matters which apply at that level. All these people, plus most of those supporting them, are volunteers. There are only a limited number of paid staff involved.

It has been my experience, in both this hobby of amateur radio as well as other groups I have been involved in, that volunteers are usually hard to find and that it's usually the same old group who does the work. That works for only a short period — until those who are doing all the work start to suffer from burnout and decide to leave it to the others. When that happens, unless new faces have been found, there are fewer people doing the work, causing more burnout and so it goes on. This problem is not new and has been faced by all WIA Councils at some time or other. How many times can you remember when there have not been sufficient candidates to warrant an election for positions in your Division?

You might think it is a good situation not to have to bother about elections but in the long term it is us, the members of the amateur fraternity, who will suffer. How do we get over this problem and maintain a steady flow of new blood into the non-radio side of the hobby?

One approach taken by my local Division is to limit the number of consecutive terms that an individual can serve in any one position. By this means, people are at least forced to rotate through some of the available jobs, or new people found so that some of the present incumbents can retire from the scene for a while to re-charge their batteries. While this approach works for my local Division, it is not necessarily the answer for others. In any event, it can only work if there are fresh people willing to stand up and be counted.

Do you always agree with what your Division or the Federal Council is doing? Probably not — we are never all always satisfied with what's happening. What can you do about it? Rather than just bleat to anyone who will listen, or spread unfounded rumours about what your elected representatives are doing, write to them or go see them, have an eyeball contact and let your views be known. While you are there, find out more about how things work at the Divisional and Federal level. If you think that you can do better, then stand up and be counted — nominate for a position at your next Council elections. No-one is going to be offended by your standing. Who knows, you may even get elected. If not, at least you have tried. Don't give up, however, try again next time.

Most Divisions have elected their Councillors and appointed or elected their Federal Councillor for the coming year. That makes this the ideal time to start finding out about the workings of the WIA so that you can be better informed and ready to volunteer when the next elections are held. Remember, without volunteers, the WIA (both at the Divisional and Federal level), the Radio Clubs and all they provide will stagnate and die. Not only do you need your hobby, your hobby needs you!

Kevin Olds VK1OK
Federal President
ar

Amateur Radio and the Transcontinental Balloon Crossing

*Roger Harrison VK2ZTB**

Amateur radio played a strong role in Dick Smith's crossing of Australia by balloon, organised and coordinated by the WIA's NSW Division.

The general details of the story of Dick Smith's successful crossing of the Australian continent by balloon is, by now, generally well known, having gained considerable press, radio and television coverage in June this year. As some readers may have noticed from television coverage, or from frantic activity on the HF bands, amateur radio was an integral component of the event. This is the story behind it.

Tipped off

A tip-off to the Federal Office in mid-1992 suggested the WIA might somehow become involved in Dick Smith's Transcontinental Balloon Attempt, then in the planning stages. The Federal Secretary/General Manager, Bill Roper VK3ARZ, passed the news to me and I followed up with a letter to Dick, whom I have known personally since the early 1970s.

I wrote to him in early September 1992, offering the support of the NSW Division in arranging communications between the balloon and the Terrey Hills headquarters of his publishing company, Australian Geographic.

Dick's secretary faxed me at the Division in early November to set up a meeting to discuss the project. Subsequently, we had a working lunch in his office on 1st December in which Dick outlined the general history of long distance balloon flights and the six previous attempts to Cross Australia by balloon — none of which had been made by an Australian. Dick's aim was to set that right and have a ripping adventure into the bargain!

Dick revealed he planned to carry his Yaesu HF rig and an antenna tuner in the gondola slung beneath the balloon, driving a dipole-type

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1993 Fees	
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Hugh Blemings Don Hume	VK1DO VK1YYZ VK1DH	3.570 MHz LSB, 146.950 MHz FM, 438.525 MHz FM each Monday evening (except the fourth Monday) commencing at 8.00 pm. Repeated on Wednesday evening at 8.00 pm on 146.950 MHz FM.	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Secretary/ Treasurer (Office hours	Terry Ryeland Roger Harrison Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2ZTB	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530	VK3PC VK3XV VK3XLV	1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	Ross Marren Lance Bickford David Travis	VK4AMJ VK4ZAZ VK4ATR	1.825, 3.065, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allan Maurie Hooper Bill Wardrop	VK5BJA VK5EA VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North,(146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Secretary Treasurer	Andrew Dixon Ted Beard Peter King	VK7GL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $53.65 $39.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades

Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to *Australian resident* (F) (G) (X) grades at fee x 3 times.

antenna which was to have one half sewn into the balloon canopy, the other half trailing below.

He had been in touch with his old firm, Dick Smith Electronics (which he sold off to Woolworths in the early 1980s), which distributes Yaesu amateur equipment in Australia, and had obtained their support in providing equipment for amateur radio communications between the balloon and Australian Geographic in Terrey Hills.

Dick explained that he was setting up a "Mission Control" centre in the recently-built visitors centre and presentation facility at Australian Geographic and took me on a tour of the large, open room. Major sponsors and supporters, Telecom and the Bureau of Meteorology, among others, were to have space there for the duration of the attempt and he wanted an amateur station there as well. His plan was to have Mission Control open to visitors 24 hours a day and he wanted the amateur station continuously operational. A tall order!

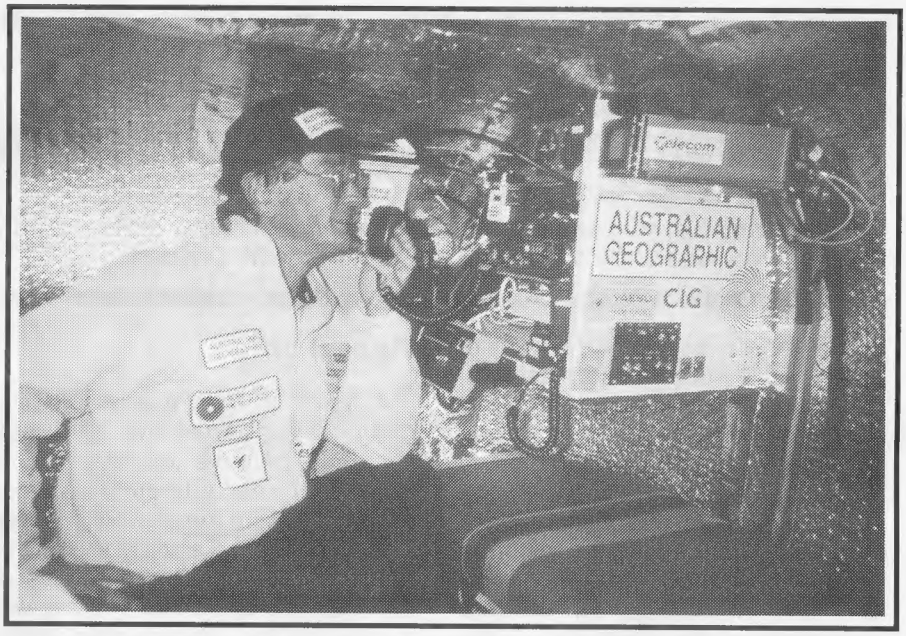
As schools were being invited to visit Mission Control during the balloon's crossing, there was an opportunity to expose youngsters to the excitement of amateur radio, and Dick also wanted to use amateur radio as "fallback" communications to Mission Control, if necessary. He saw the Mission Control station acting in a net control role during times when he would be on the bands.

The opportunity to involve amateur radio — and the radio amateurs of Australia — in an historic event, provide an element of practical communications support, and to take advantage of a tremendous publicity opportunity was one that could not be passed up.

Planning

The day after my lunch with Dick, I phoned the amateur radio products manager at Dick Smith Electronics, Chris Ayres VK2YUK, to discuss the project. He outlined the role DSE expected to play in providing equipment and we agreed to liaise as things developed.

I subsequently advised the Divisional Council, who were enthusiastic at having the Division involved and discussed the event with Divisional Special Projects Officer, Stephen Pall VK2PS. Steve was immediately enthusiastic and agreed to provide whatever assistance was within his capabilities, particularly in regard to finding volunteers to staff the Mission Control station and coordinating its operation.



Dick Smith in the gondola of the balloon.

We discussed the possibility of obtaining a "special event" callsign and what logistic arrangements would be necessary.

The flight was scheduled to take off on Monday, 31 May 1993, from Carnarvon in Western Australia, which gave us a short six months.

Steve Pall, Chris Ayres and myself had a planning meeting at Australian Geographic early in the new year, surveyed the proposed Mission Control centre and planned where antennas might go. The centre overlooks a bushland garden area, with a small lake and wandering emus! The antennas had to go behind the lake.

A little propagation planning (using the Graph-DX computer program!), and calling on past experience, told us that we'd need to use 14 MHz and a beam to achieve good quality signals between Sydney and Western Australia. We'd be able to use 7 MHz as the balloon approached the eastern states, so a dipole or perhaps a long wire would serve.

Chris indicated that DSE would provide two rigs, a Yaesu FT1000 and an FT990, so two stations could possibly be on-air at the one time.

As planning progressed, we had to find a beam and support tower for 14 MHz operation. Rudi Breznik of Emtronics was approached and agreed to help out.

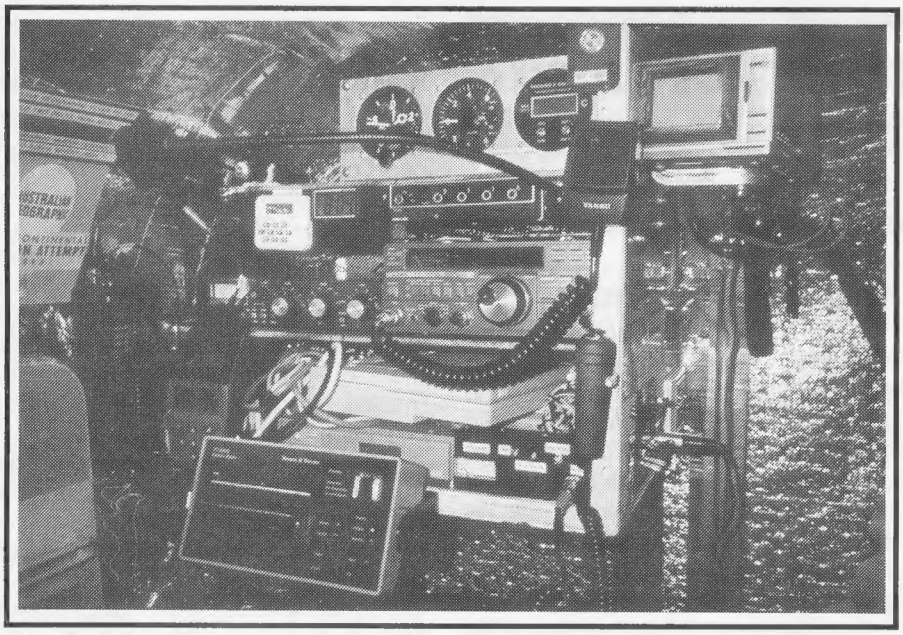
I approached the NSW branch of DoTC to obtain a special event callsign and the Division was duly issued with VI2AUS, to use between 1 June and 30 June.

Final days

A few weeks before the scheduled launch, we were advised we had access to the Mission Control centre to setup. Chris Ayres and Steve Pall did sterling work in setting up the equipment. The NSW Division's large, painted canvas sign saying "Amateur Radio We Talk to the World" was slung on the wall above the station, with a roundel of the Division's logo beneath it. A panel carrying amateur radio publicity material and QSL cards was set up adjacent to the equipment desk.

Publicity material on the hobby of amateur radio and the WIA's role in the hobby, aimed at the general public, was provided as a handout.

A press function was called by Dick ten days before leaving for Carnarvon at which we had the opportunity to explain to the attending press and TV



The control console in the gondola. Note the amateur radio installation. (Photos courtesy Australian Geographic)

crews how amateur radio would be involved in the event.

Dick publicised the Transcontinental Balloon Attempt in Australian Geographic early in 1993, including a large wallposter. A limited number of spare copies of this wallposter were obtained and inserted in VK2, VK4 and VK6 copies of the May issue of Amateur Radio to publicise the event and amateur involvement.

The coming event was also publicised on the NSW Division's Sunday broadcasts during May.

A briefing of the 15 volunteers organised by Steve Pall was held on the weekend before the launch to familiarise them with the equipment and the operations.

Up and away

After a setback on the scheduled launch date on 31 May, Dick had to await favourable weather conditions. The chance came on 16 June, and Dick and co-pilot John Wallington were away.

VK2AWI at Mission Control immediately became active and operated over the subsequent 40 hours of the flight. Eight volunteers operated over the two days, using 14 MHz and 7 MHz. There were a total of 230 QSOs in the 40 hours, and amateurs from every state and territory gave tremendous support. A number volunteered to act as relay stations on occasion, from VK6, VK5 and VK4. Their help was greatly appreciated.

The amateur operation gained some valuable coverage on television, which gave the whole event considerable air time.

Dick landed at 1713 EAST on Friday 18 June, some three kilometres north of Tabulam, a little village 40 km west of Casino in northern NSW.

To celebrate the event, VI2AUS was then activated. In the following 13 days, approximately 1500 contacts were made on CW, SSB, FM and packet. HF band conditions declined in the latter half of June, unfortunately, so VI2AUS operations had to tolerate poor conditions. Six volunteers activated the callsign.

Dick Smith Electronics is having a special QSL card printed for VI2AUS operations. All those who made contact, or listeners who heard the station, should QSL via VK2WI. For those who contacted VK2AWI, a QSL stamped to mark the occasion, can be obtained via VK2WI. If you want direct replies, please include a stamped addressed envelope.

Thanks

Heartfelt thanks to all those involved in making this event the success it turned out. Firstly, to Dick Smith VK2DIK for providing the adventurous opportunity, and particularly Stephen Pall VK2PS for his tireless efforts and input of ideas, as well as Chris Ayres VK2YUK and the management at Dick Smith Electronics who provided the Yaesu equipment, NSW DoTC for VI2AUS, Rudi Breznik from Emtronics who supplied a beam antenna and portable tower, Stephen Montgomery from Australian Geographics and the team of amateurs who volunteered and participated, and the Australian amateur radio community for providing enthusiastic on-air support.

*Locked Bag 888, Woollahra NSW 2025

ar

WIA News

Yaesu founder silent key

Sako Hasegawa, JA1MP, the founder of the Yaesu Musen company which manufactures the popular brand of amateur equipment, died in Tokyo on 12 June, according to a report in the 28 June issue of the *ARRL Letter.*

Hasegawa became involved in introducing single sideband to Japanese amateurs in the 1950s. In the following decade he was a driving force in opening up other new modes for amateurs, particularly radioteletype, said the report.

Honour for wife of well-known amateur

Norma Topp, wife of well-known NSW amateur, Aub Topp VK2AXT (NSW Divisional Librarian at Amateur Radio House, Parramatta), was honoured with the award of the Order of Australia Medal, the OAM, in June.

Norma received the medal in recognition for her services to the NSW Society for Crippled Children and to the Tall Women's Association. Congratulations, Norma!

Radiocommunications Act 1992 & "Judicious Rex"

*George Brzostowski VK1GB**

My attention has been drawn to a rumour among WIA members, particularly in Victoria, that I am the person posing under the pseudonym of "Judicious Rex". I would like to have the opportunity of dissociating myself from that person's article. The way "Rex" was described in the February edition of *Amateur Radio Action* magazine has such remarkable historical resemblance to my past, that I am really intrigued as to how much of that description was editorial (perhaps judicious?) licence, and how much was true. For my part I know of no other lawyer who has served as a WIA divisional federal councillor in the last 20 or so years, other than Mike Owen, who is now in the UK. I have reason to believe that Mike would not have written such an article.

While much could be said about the way in which that article was expressed, it is the content about which I would not be proud. For my part, I am not known for wanting to remain unaccountable through a cloak of anonymity. Some of the legal observations in "Rex's" articles have, I am advised, also affected my standing within the eyes of some DoTC officers. To that extent the quality of our anonymous friend's articles has affected my credibility, and I wish to correct both the record and the impressions.

The response by Mr Roger Smith, First Assistant Secretary, Radiocommunications Branch, Department of Transport & Communications in the May edition of ARA, goes some way towards allaying the needlessly aroused fears. However, as unnecessary fear is still being expressed by some members to the Federal Office of the WIA, I feel is it proper to go further, and to deal conclusively with Rex's mistaken notions.

"Mandatory Penalties"

Page 13 of ARA Vol 15, No 12, refers to some penalties being expressed as "imprisonment for up to 2 years", and then sets out in bold letters, warnings like "There is no provision for a fine", and "mandatory imprisonment" (twice). There is absolutely no substance for these allegations, and it is quite inappropriate to make them while failing to refer to the provisions of the Crimes Act 1910 of the Commonwealth. Mr Smith has referred to section 4B of that Act,

The day of the dragon has not yet arrived, and is unlikely ever to do so.

which provides that "where a natural person is convicted of an offence against the law of a Commonwealth punishable by imprisonment only, the Court may, if the contrary intention does not appear and the Court thinks it appropriate in all the circumstances of the case, impose, instead of, or in addition to, a penalty of imprisonment, a pecuniary penalty not exceeding an amount calculated using the formula

Term of imprisonment in months/6 × $3,000

This type of provision has been part of the Act for many years, and a form of it was previously found in section 16 of that Act. Perhaps in its simpler form it was easier to understand, but the point is that it was not the policy of the Commonwealth to deprive the courts from having power to tailor a penalty to fit the crime actually committed.

"Rex" tried to answer Mr Smith by emphasising the use of the word "may" and by claiming that the convicted person would have an onus to establish that the "contrary intention does not appear", and that "the court ought to think fit not to impose a term of imprisonment". That is applying the wrong standard. The convicted person does not have any onus cast upon him. The duty of a court considering what should be the penalty is also governed by the terms of section 16A, which sets out an extensive list of matters which the court must take into account. Here one will find references to "the nature and circumstances of the offence", or the "character, antecedents, age, means and physical or mental condition of the person", etc.

However that is not the end of the matter. Section 16C(1) must not be forgotten. "Before imposing a fine on a person for a federal offence, a court must take into account the financial circumstances of the person ....", and 16C(2) provides, "Nothing in subsection (1) prevents a court from imposing a fine on a person because the financial circumstances of the offender cannot be ascertained by the court." In other words, if a fine is felt to be appropriate, then a fine will be imposed. A person's poor financial circumstances will tend to minimise the degree of the fine.

There is a distinct requirement imposed on courts to consider every alternative to imprisonment first. Subsection 17A(1) makes it quite plain that "A court shall not pass a sentence of imprisonment on any person for a federal offence .... unless the court, after having considered all other available sentences, is satisfied that no other sentence is appropriate in all the circumstances of the case."

Finally on this point, there is section 19B providing for the discharge of deserving offenders without proceeding to conviction, ie placing a person on a good behaviour bond, and section 20AB providing for use of community service order schemes, which are now in force in all jurisdictions.

The above observations should allay all needless fears by people who are otherwise law-abiding citizens. The day of the dragon has not yet arrived, and is unlikely ever to do so.

When the 1982 Radiocommunications Bill was going through Parliament, I submitted that there should be an offence of possession of transmitting equipment without a

licence. For policy reasons, which have never been explained to me, there was no such offence provision. Section 23 of that Act made it an offence for a person to operate or have in his possession for the purpose of operation, a radiocommunications transmitter, except in accordance with a transmitter licence. One still had to prove the element of purpose of operation. In practical terms it meant one still had to prove actual use.

The recent Radiocommunications Act 1992 is an improvement, and despite its length, is somewhat easier to understand than its predecessor. That does not mean it is not confusing, so I will try to deal with the major provisions which may seem to affect radio amateurs.

Radiocommunications device

Sub-section 7(1) defines a "radiocommunications device" as —

(a) a radiocommunications transmitter *other than a radiocommunications transmitter of a kind specified in the regulations,* or

(b) a radiocommunications receiver of a kind specified in the regulations.

Sub-section 7(2) defines a radiocommunications transmitter as —

(a) a transmitter designed or intended to be used for the purpose of radiocommunication, or

(b) anything .... designed or intended to be ancillary to, or associated with, such a transmitter, for the purposes of that use.

Sub-section 7(3) defines a radiocommunications receiver, but I do not need to set it out here.

The important matter is that **all** transmitters are radiocommunications devices, except for those transmitters which are of a kind specified in the regulations. In other words, until there are any regulations, all transmitters are covered by this definition.

As far as receivers are concerned, no receivers are radiocommunications devices except those of a kind specified in the regulations. Until regulations specify any kind of receiver, all receivers are excluded from the operation of provisions pertaining to radiocommunications devices.

The above observations are consistent with Mr Smith's letter, and in total contrast with "Rex's" attempt to interpret the Act. I hope I have met "Rex's" challenge on page 32 of ARA Vol 16 No 1.

Non-standard devices

Sub-section 9(2) defines a "non-standard device as a device that —

(a) if the device has not been altered or modified in a material respect after its manufacture or, if it has been imported, after its importation — does not comply with the standard that was applicable to it when it was manufactured or imported ..."

In other words, a device in respect of which there was no standard at the time of its manufacture or importation, can never be a non-standard device.

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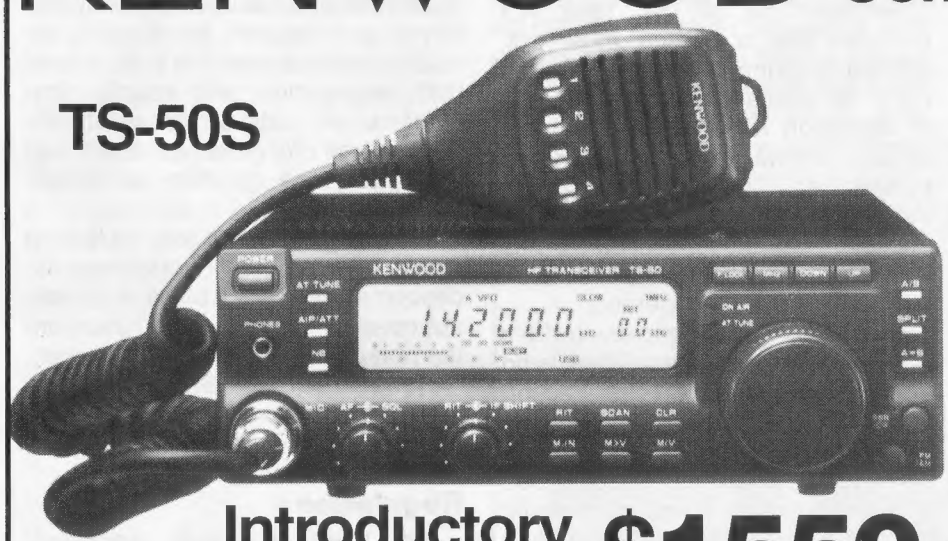

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Licensing of radiocommunications

Section 45 prohibits unlicensed radiocommunications, except in emergency, and permits the use of radiocommunications devices in accordance with appropriate licences.

Offences under 1992 Act

Section 46(1) provides that a person must not, without reasonable excuse, knowingly or recklessly, operate a radiocommunications device *(which by definition means **all** transmitters except those specified by regulations, and NO receivers until any class of receiver is also specified in the regulations)* **otherwise than as authorised** by a proper licence. If the radiocommunications device is a transmitter, the penalty is "imprisonment for 2 years" - remember "Rex's" alarm? If the radiocommunications device is NOT a radiocommunications transmitter, *(presumably a receiver of a kind yet to be specified in the regulations)* the penalty is specified as $2,000.

There is also the provision which prohibits a licensee from using his equipment outside his authorised bands. This covers cases where a piece of equipment, usually made overseas, can transmit beyond the Australian band edges. If you stay within the band, you have nothing to concern you.

Section 47 provides that a person must not, without reasonable excuse, have a radiocommunications device in his or her possession for the purpose of operating the device otherwise than as authorised by a relevant licence.

Both section 46 and 47 are subject to section 49 which saves a person who has used a radiocommunications device in serious emergency circumstances.

Section 48 gives an extended meaning to the words "possession for the purpose of operation" in section 46 and 47. This new definition goes some way to meeting my 1982 submissions to make possession without a licence an offence. I welcome the change.

Non-standard devices

Section 158 of the 1992 Act provides that a person must not, without reasonable excuse, have in his or her possession for the purpose of operation a transmitter that the person knows is a non-standard transmitter. The penalty for an individual offender is set at a maximum of $12,000. Section 159 has an extended meaning of possession for the purposes of operation.

Firstly, the penalty provision does not include imprisonment. There is no inconsistency between this section and section 46 . Section 46 prohibits the use of transmitters except as permitted by a relevant licence. Use of a sub-standard transmitter would not be use in accordance with a licence. Therefore if one had to one's knowledge, a non-standard transmitter in possession for the purposes of operation, one would not be committing as serious a breach until one actually used such a transmitter. Upon using that transmitter, one would be first committing a breach of section 46, and also a breach of section 158.

To make it easier for the prosecution to prove knowledge that a device is non-standard, section 161 allows the court to look at a person's abilities, experience, qualifications and other attributes.

However there is no warrant for "Rex's" allegation (AR Vol 15, No 12 page 14) that possession of amateur equipment which has been modified so as to enable it to transmit outside an amateur band is "non-standard". There must first be standards applicable at the date of modification. So far, there are standards applicable to CB radios and cordless telephones, and perhaps other low power devices. "Rex's" claims in his attempted reply to Mr Smith (ARA Vol 16, No 1, page 32) are so unhelpful, that I do not know about which legislative provision he is commenting. Pity. It might have been interesting. Mr Smith, on the other hand is quite correct.

Radiocommunication Devices

Section 301 provides a means of prohibiting traders from supplying "eligible radiocommunications devices" to consumers without production of a suitable licence by the buyer, and requires the supplier to record certain details. It is to be hoped that regulations will specify the classes of radiocommunications devices as "eligible devices", as otherwise the section achieves nothing.

It is a pity that there may be hiatus insofar as amateur equipment is concerned, and it is a pity that it does not cover the sale of transmitters on the non-dealer second hand market.

However what Mr Smith does say in his second point (on page 30, right hand column) is perfectly correct.

Regulations

Yes, there is a wide regulation making power, and yes, regulations made by the Governor-General are a subordinate form of legislation. They do however have to be laid before Parliament, {Acts Interpretation Act 1901, sub-sections 48(1)(c) and 48(3)-(7)} and may be disallowed, as has sometimes happened, particularly in

WIA News

NZART survey supports retention of Morse

A recent survey by the New Zealand Amateur Radio Transmitters (NZART), which questioned attitudes to the Morse Code among members, showed healthy support for competency in Morse Code as a prerequisite for full licence privileges.

According to a report on the survey results in the July issue of *Break-In,* the NZART's journal, an average 32% considered it essential, 44% considered it desirable, while remarkably, an average 22% believed Morse competency was unnecessary. The statistics were heavily qualified, though.

Members did not support a foreshadowed NZART Council move on approaching their licensing authority for a non-Morse HF licence. Some 64% of members believed New Zealand should never have a no-code HF licence.

the Senate. The Wireless Institute of Australia has established a good working relationship with the Department of Transport & Communications, and there is no reason to believe that it will be different with the new Spectrum Management Agency. I hope that it will be given all necessary resources.

The WIA has been consulted regularly in the past, and there is no reason to believe this will cease. On the contrary, there is a clear policy to engage in consultative processes, and the WIA will play its part.

Summary

Putting it bluntly, anyone who has a receiver, or a device which includes a receiver, which is not the subject of any regulations, can continue using such unspecified receiver without a licence. On this point "Judicious Rex" is simply wrong (ARA Vol 15, No 12, page 13), and it is a pity that such blatant errors mar an article which has otherwise some merit. It is a pity that some amateurs have been needlessly alarmed at the thought of having to dispose of their wide-band receivers.

If you have a modified transceiver or transmitter, ascertain if there was any standard in force at the relevant time. If there was no standard, then make sure you use it only in accordance with the terms of your licence, and that includes staying within the band edges. If you are a traditional amateur and delight in making your own, do not worry, there is no standard at present applicable to home-brew!

Finally, enjoy your hobby by obeying the licence conditions, staying within your band segments, and obeying ordinary rules of conduct. You can also help the WIA in its role by joining it, and getting others to join!

* *GPO Box 789 Canberra ACT 2601*

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Help stamp out stolen equipment — always include the serial number of your equipment in your Hamad

Random Radiators

with Ron Cook VK3AFW and Ron Fisher VK3AFW

Some months ago now, we promised details of a Z Match Antenna coupler that would operate on 160 metres. Well, we organised our local Z Match constructor to put together a prototype which was tried out locally and then dispatched to Z Match expert Lloyd Butler VK5BR for his analysis.

However, a basic description of it first. It is built along the lines of the original AR Z Match described in February 1993 AR but with a larger coil to tune down to 160 metres. We found that this unit would operate over the range of 160 to 20 metres. This seems to be a reasonable compromise for amateurs using a tri-band yagi and a centre fed (with open wire line) dipole for say 80 metres. With this coupler an 80 metre dipole will give excellent results on 160. See you on 160! Now over to **Lloyd Butler VK5BR.**

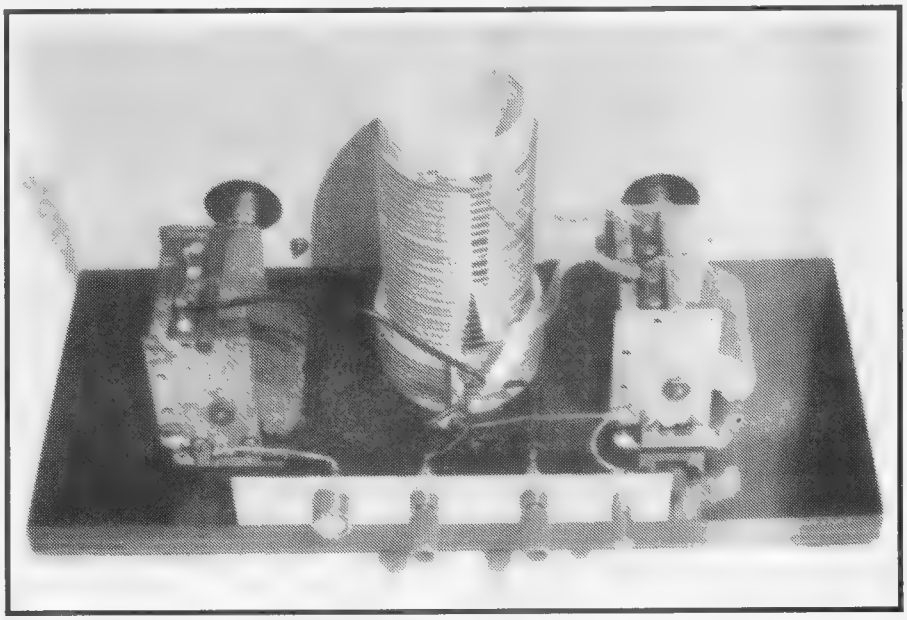
Some Tests on a Z match Tuner for 1.8 to 14 MHz

Introduction

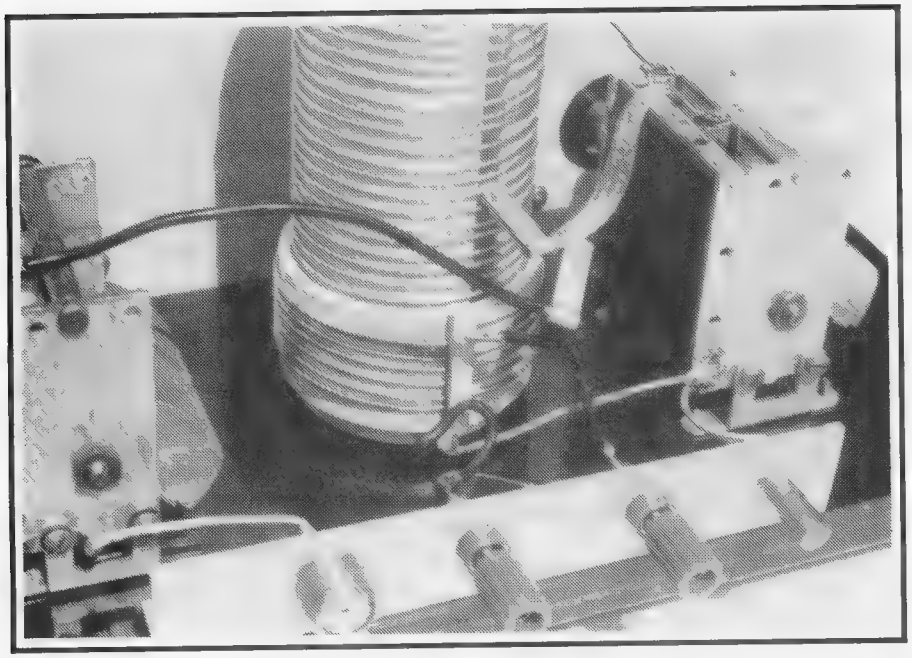
Our Melbourne Z match constructor has been busy again with a new coil assembly having higher inductance than that used in the AR Single Coil Z match which was previously introduced. The original AR circuit operated within the range of 3.5 to 28 MHz. I did show how the original circuit could be extended down to 1.8 MHz by switching in fixed capacitors but the idea of this new coil is to include 1.8 MHz without switching. In doing this, operation above 14 MHz is sacrificed for the lower frequency facility. The project is being introduced through the Random Radiators column and, as before, I have been seconded to carry out some tests and report on its performance. I will confine my discussion to the performance tests and refer you to my previous article (Ref 1) for more detail on the single coil Z match operation.

The coil assembly, as supplied, was made up of a 30 turn primary winding on 56 mm PVC tube and a 6 turn secondary winding on 65 mm PVC tube which was slipped over the cold end of the primary. Both windings were wound with 16 SWG (1.6 mm) tinned copper wire. The coil was constructed so that I could easily experiment with the coil tap positions to obtain the best performance.

As a result of a considerable amount of experimentation, I fixed the full coil connection at 27 turns and the



Rear view of 160 — 20 metre Z match.



Close-up view of output winding.

two taps on the coil at 12 and 20 turns as shown in figure 1. With this arrangement I was able to achieve a match over a resistive load range of 10 to 2000 ohms on each of the bands 1.8, 3.5, 7, 10 and 14 MHz. In this respect the new assembly performed much as did the AR 3.5 — 28 MHz unit. However, further on I will discuss a few limitations in its performance which were not apparent in the higher frequency range unit.

Tuning Curves

The input capacitance required as a function of load resistance for each frequency band is plotted in the family of curves, figure 2. The maximum capacitance plotted is around 450 pF but a little larger than this can be required where the load is partly reactive. I suggest the use of a variable capacitor around 600 pF, possibly made up with the sections of a two gang unit paralleled.

In a further family of curves, figure 3, shunt capacitance is plotted as a function of load resistance for each frequency band. The maximum capacitance plotted is around 430 pF but again I would suggest a larger two gang unit of around 450 to 500 pF per side to allow for certain complex loads.

More on the Performance & Some Restrictions

As I had previously done on other Z match tuners, limited tests were carried out with partly reactive loads. This particular unit handled inductive reactance quite well but on the 3.5 and 7 MHz bands its ability to match loads with capacitive reactance was restricted. Connected in series with a 50 ohm resistance, reactance that could be handled was recorded as follows:

1.8MHz	−1000 to +1000 ohms
3.5MHz	−500 to +350 ohms with a gap between −25 & −200 ohms
7.0MHz	−70 to +1000 ohms
10MHz	−1000 to +1000 ohms
14MHz	−500 to +300 ohms

Of course the restriction in reactance value also varies with the value of series resistance component but the chart illustrates the trend.

Another disadvantage of this particular Z match unit is its maximum power rating for a given tuning capacitor plate spacing. Relative to the higher frequency Z match, the whole tuning range has been shifted down by an octave in frequency but the tuning capacitances used are barely above those used in the higher frequency unit. The effect of this is nearly to double the loaded Q factor in the tuning system and nearly double the voltage developed for a given power. Let's consider an input capacitance set at 100 pF on 3.5 MHz. This gives a reactance of around 455 ohms and hence, for the input to look like 50 ohms, the loaded Q must be equal to 9. A power of 100 watts fed to the input develops a peak voltage of 100 V across the 50 ohms. This voltage is multiplied by Q to a value of 900

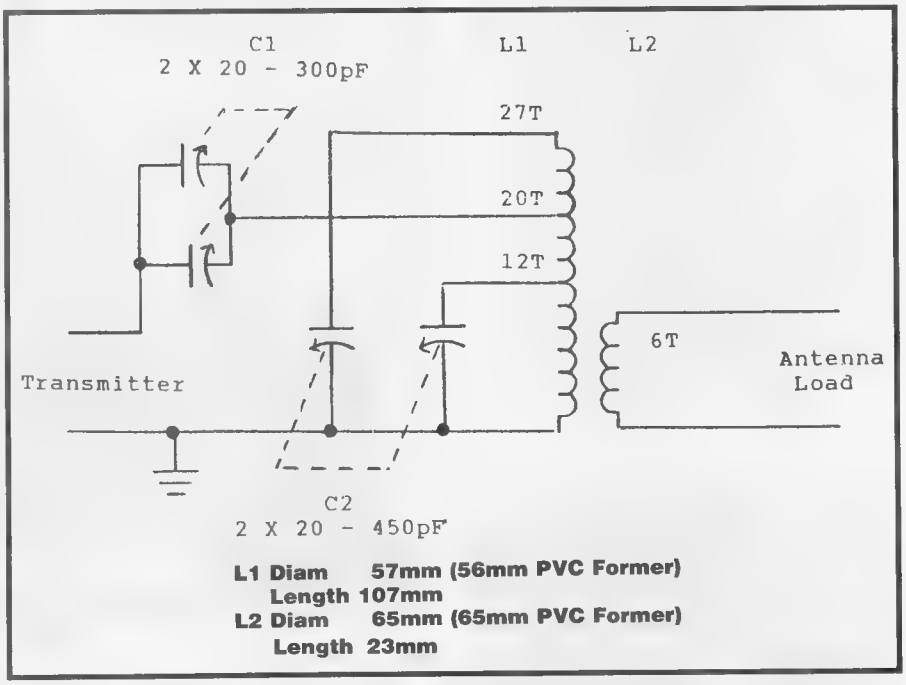


Figure 1 — Single Coil Z match Antenna Tuner 1.8 - 14 MHz.

V, near the limit of breakdown of our typical receiver tuning gang with 0.25 mm spacing. If we look at the curves for the input capacitor in the higher frequency unit (refer my previous article), we see that the load resistance can go right up to 1000 ohms before the capacitance falls below 100 pF. In this unit, one could expect the capacitor to withstand the voltage developed for any load resistance below 1000 ohms. If we now look at the curves for our new unit (refer figure 2), we see that the input capacitance falls below 100 pF for load resistances above 250 ohms. We now have a possibility of capacitor breakdown above the lesser load resistance value of 250 ohms.

To examine the situation further, the frequency at 1.8 MHz is near half that at 3.5 MHz and hence at 1.8 MHz the capacitance to produce 900 V peak value for 100 watts of power is 200 pF. Referring again to figure 2, we see that this value of 200 pF also coincides with 250 ohms of load resistance and therefore the voltage breakdown conditions are much the same as at 3.5 MHz. At the higher frequencies, the voltages are calculated to be lower, and there is no real problem. However, it seems clear that if normal receiver gang capacitors are used with 100 watts of power, antenna load resistance at 1.8 and 3.5 MHz should be restricted to not greater than 250 ohms.

The power rating for higher resistance loads could be improved by either of two methods. The first is to increase the capacitor plate spacing but where does one get wide spaced capacitors of around 500 pF? The second is to reduce the value of coil inductance and use larger values of input and shunt capacitance. The increased input capacitance could be achieved with paralleled sections of a two or three gang variable capacitor. However, unless one could set up a four gang assembly, extension of the shunt split stator capacitances would have to be achieved by switching in fixed capacitors across the variable gang sections. Of course this defeats the whole objective to make it work at 1.8 MHz without switching. So if we are stuck with the normally obtainable receiver type tuning capacitors and we don't want that switching, we have to tolerate the power restriction discussed.

Efficiency

Because there is extra winding length to achieve a higher inductance in this new Z match unit, field linkage between primary and secondary is lower than in the higher frequency single coil unit. The coefficient of coupling between the full primary winding and the secondary winding has been measured as 0.46. This is somewhat lower than the value of around 0.65 common to the higher frequency single coil unit and previous two coil units. I was interested to see what effect this had on power efficiency so I did some efficiency tests at 1.8 MHz which is one frequency which uses the full length of the primary.

In one test I fed an RF signal directly into a 50 ohm load and measured the load current. This was compared with the load current when using the same signal source, at the same signal level, fed via the matched Z match tuner. Within the limits of accuracy of the RF ammeter used, the two currents (and hence the derived powers) were read as essentially the same.

In another test, I compared the measured current into my own 1.8

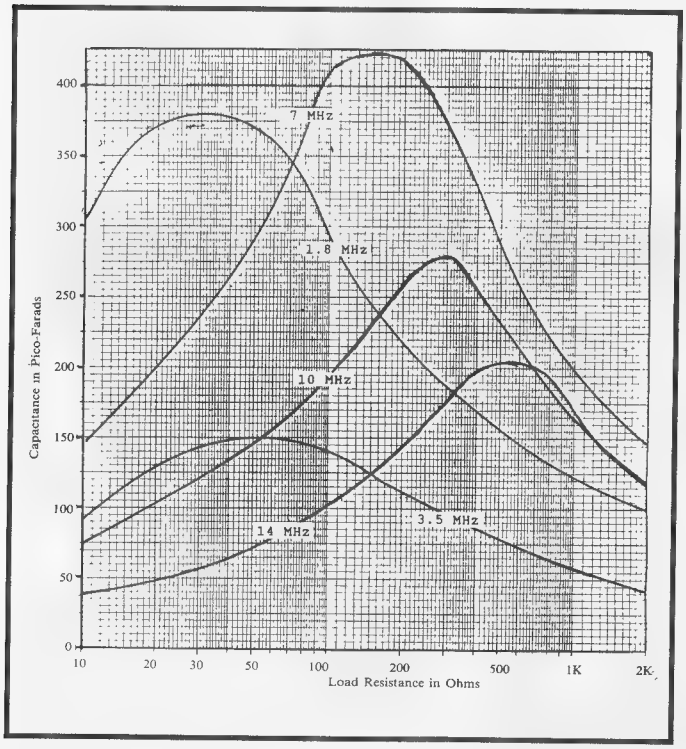


Figure 2 Input Capacitor Matching.

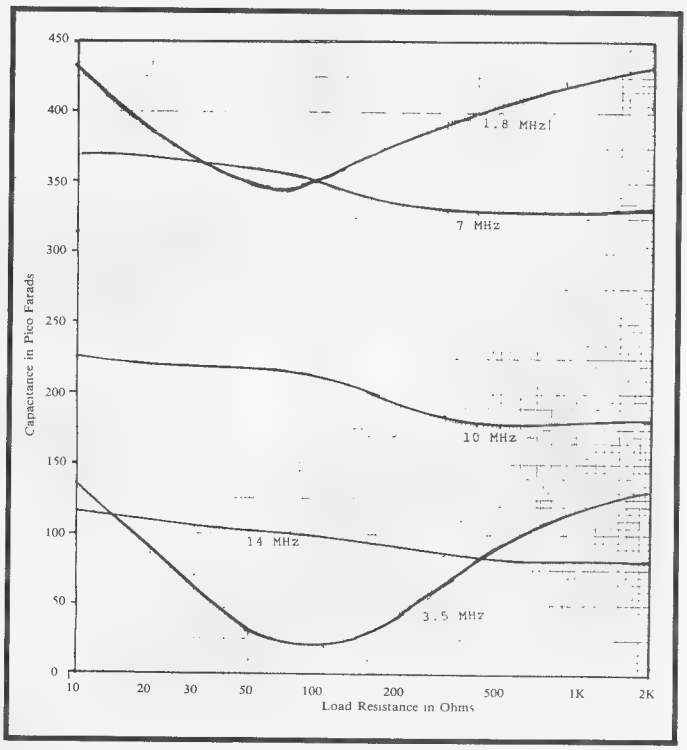


Figure 3 Shunt Capacitor Matching — (Capitance value is for one half of split stator unit).

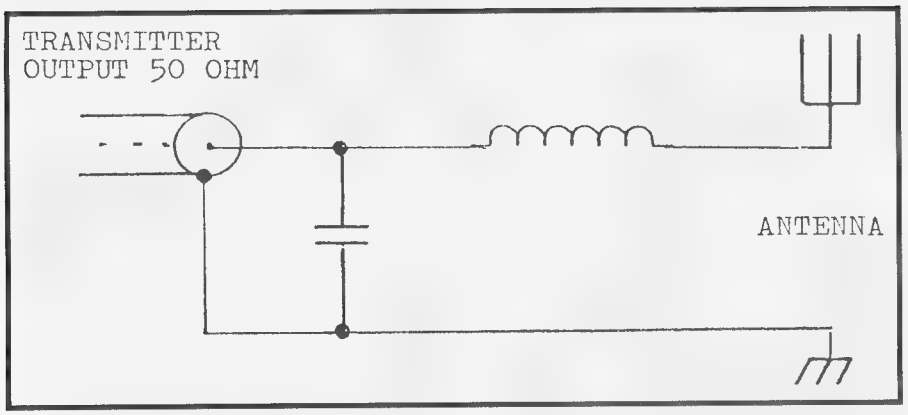


Figure 4 Simple L Match Network.

MHz antenna system via the Z match tuner with the measured current via a simple fixed L network which I normally use for that antenna. This type of network (figure 4) is probably as efficient a matching network as I could substitute. The antenna, operated against a counterpoise, measures around 30 ohms total resistance (that is, radiation plus loss resistance). Much of it is made up of a random length of feed line to another antenna and by chance rather than by design, its length happens to be such that its reactive component is small. To maintain equal power for the two measurements, power was set at 50 watts as indicated on an SWR/Power meter facing the transmitter source. Using the L network, antenna current was 1.28 amps which calculates to 49 watts into 30 ohms. Using the Z match, the antenna current was 1.22 amps, ie 45 watts into 30 ohms. The test indicates a slightly greater loss in the Z match but considering that the Z match is a continuously adjustable device to suit all sorts of loads, the result is good.

I short cut efficiency tests on all bands to doing one other test on 14 MHz, the other end of the Z match tuning range. On this band I ran a power of 10 watts and made use of a Marconi 50 ohm loading RF wattmeter. Using a similar comparison technique to that used on 1.8 MHz, power efficiency was derived as being near 80%.

Summary

The Single Coil Z Match tuner discussed matches a resistance load range of 10 to 2000 ohms at frequencies between 1.8 and 14 MHz without any form of switching. It doesn't work quite as well as the higher frequency range AR Single coil Z match described previously in Amateur Radio. I have highlighted two limitations in its performance as follows: Firstly, at 3.5 and 7 MHz it has a limitation in the range of loads it can match when there is capacitive reactance in series with the load. Secondly, because it generally operates with a higher loaded Q than in the other unit, voltages developed across the tuning capacitors are higher. If receiver type tuning capacitors are used, arcing could be experienced at 1.8 and 3.5 MHz, even at low powers, when antenna resistance is greater than 250 ohms. No problem should be experienced with arcing if high impedance antenna feed systems are avoided or if wide spaced tuning capacitors can be obtained.

Power efficiency measurements were essentially limited to tests with a load of 50 ohms and at the extreme frequencies in the tuner range of 1.8 and 14 MHz. From these measurements, power efficiency was considered to be good.

In conclusion we must summarise the differences in the performance of the Z match unit described and the higher frequency unit. In the simple single coil form without switching, the described unit tunes 1.8 to 14 MHz whereas the higher frequency unit tunes 3.5 to 28 MHz. The second unit can be extended down to 1.8 MHz by the addition of several high voltage fixed capacitors and a switch so that a range of 1.8 to 28 MHz is then achieved. As discussed in a previous paragraph, the described unit can be more prone to capacitor voltage breakdown and appears to be more restrictive in the range of reactive loads it can handle.

Thanks to Lloyd Butler VK5BR for that interesting test report.

So that's it for another month. Good luck with your antenna experiments and it's good bye from him and goodbye from me.

The two Rons.

References

1. Lloyd Butler VK5BR — The "AR" Single Coil Z match — Antenna Matching with One Fixed Coil and No Switches — Amateur Radio, April & May 1993.
2. Random Radiators (VK3OM & VK3AFW) — The "AR" single Coil Z Match — Amateur Radio, February 1993.

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WIA News

Celebrating first UK-Australia radio contact

It seems the first message ever transmitted by "wireless" between the UK and Australia happened 75 years ago, on 22 September 1918, according to a 1933 book titled, "Wireless Over Thirty Years," written by R.N. Vyvyan.

To celebrate the event, the Dragon Amateur Radio Club of North Wales will activate GB2VK on Wednesday 22 September from the site at old Caernarfon (now Waunfawr) Marconi station, and again on Saturday 25 September, 1993. A special QSL card is to be issued for contacts and reports.

Dragon ARC chairman, Dewi Roberts GW0ABL, has written to the WIA seeking not only publicity for the event, but information on who was involved at the Australian end of the first ever UK-VK contact, and who received the message. Can anyone help?

The Dragon Amateur Radio Club can be contacted at 23, Lon Hedydd, Llanfairpwll, Gwynedd, North Wales LL61 5JY.

How to Hit the Australian Repeaters — with 28,000 Tons!

Geoff Green VK6XB/VS6DA/G3ZNV went on a cruise, and discovered he was not the only ham on board.*

Having decided to treat ourselves to a "retirement" cruise, my XYL expressed a degree of surprise when I popped a 2m handheld into the suitcase (well, she had been reading "The French Atlantic Affair" where a ham radio operator saved the ship from hijackers!). In defence of the usual mutterings, I offered that it would be interesting to see if I could work some of the 2m repeaters listed in the VK Callbook.

We sailed from Singapore on the good ship Royal Odyssey, a magnificent vessel of some 28,000 tons. Our route was via Bali to Australia, with the first port of call Darwin.

Ships seem to make a habit of arriving at places at first light; however, not to be outwitted, and clasping handheld, I slipped out of the cabin (they call them staterooms these days) and climbed up to the elevation of deck 10. In the sunrise I could see the coast and I tried my first call — nothing. Well, it was rather early, even for Darwin. Then I heard something and responded, eager for that first contact. I glanced over to the opposite rail of the deck and was confronted by a mirror image! A ham with a handheld! I'm communicating with a fellow passenger. "Hi," he says, "I'm KT6X Dick". "VK6XB Geoff" I replied, and we burst out laughing. Subsequently we unearthed a further three hams from the bowels of the ship; but for now we were keen on the first contact through the Darwin repeater. It came in the form of VK8KZZ Peter, obviously a Darwin insomniac.

An early morning crewman swabbing the deck stared in disbelief as two hams danced a hornpipe, jubilant with their first contact as if novices — perhaps scurvy was setting in? (No way on this ship!). VK8PC Charlie followed, then VK8ZWM Spud, VK8CO Trevor, VK8RH Rex and VK8UK Bob.

It was more than 35 years since I had been to Darwin, and after lunch and a look around, Charlie very kindly offered to pick us up and take us to his QTH and meet Marilyn, his XYL. We even managed a sched on 21 with VK4LC, VK6AO and VK4EKK.

"An early morning crewman swabbing the deck stared in disbelief as two hams danced a hornpipe....."

Our all too short 12-hour visit was over, and Charlie dropped us back to the ship. As we sailed away, the VK8s kept us company as long as the repeater held in.

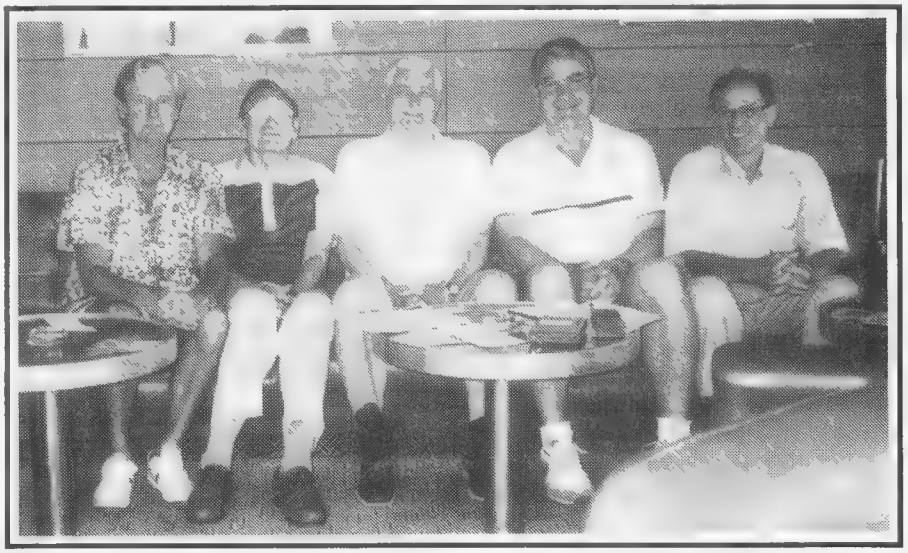
Our list showed a repeater on Thursday Island, but the pilot who came aboard there confirmed there was no activity — sad. So we had a mini-hamfest of the five on board, and invaded the radio room, much to the horror of the Chief Radio Officer who was clearly far more interested in studying the form on board than he was in having a heap of hams studying his black boxes! Joking apart, the staff were tremendous and were proud to demonstrate that the GPS of today is a far cry from the ships' brass bashing of the past, but the old 500 kHz alarm remains.

Scanning the repeater lists, Cairns would be next, and up popped Ron with the appropriate call VK4 Electro Motive Force, followed by John VK4VKL.

As we were walking to the post office my handheld burst into life — "Where are you?" it commanded. "Stay there, I'm on my way." John Roberts VK4TL ex VS6CW came running across the road. John had been a friend of my brother Stan (the original VS6DA) and Lyell VK2BE (VS6BE) in the early days of SSB in Hong Kong. How delightful that, through the medium of ham radio and the Cairns repeater, we should meet up — even the XYL was impressed!!

VK4FAB Anne and VK4MP Pat joined in as we sailed off this time, after a wine tasting in the sea terminal (.05 in charge of a moving ham station?).

Our next series of contacts would be offshore as we cruised along yet more of this incredibly beautiful coastline. Through Townsville we met VK4MWT Tom and VK4MUJ Jean, Noel VK4BVD ushered us on to Bowen, where it happened to be VK4CKC Keith's birthday and the repeater echoed with the strains of the traditional song, sung by



Mini-hamfest on board. Left to right: Geoff VK6XB, Alan VE7BSC, Bill N6LAD, Dick KT6X and Eph W2SIU.

The author, Geoff VK6XB-VS6DA-G3ZNV, with the Sony receiver to listen to the 14 MHz net, and the ICOM handheld.

shipboard ham "sirens" as in the days of Ulysses — so much so, that crane driver Geoff VK4JFU almost fell off his perch, and only regained stability by concentrating on questions about the "talent" on board ("you lucky b....s!").

On to Mackay and Wal VK4AIV

Now it was the turn of Brisbane and an early morning contact with Jack and Alma VK4VAS and 4YC, then 4ZEL Mal and 4ZQ Roy, who alerted old friends 4EKK Drake (VS6EK) and 4LC Bill. Brisbane was special for us, as the parents of our son-in-law live at Moogerah, and they came into town to meet us, so we went QRT to enjoy a family day of "bugs" and wine. As we sailed out to the fragrance of the meat processing plant, the Gold Coast repeater kept us company throughout the evening and into the next morning, with old "Sydneyite" Con VK4UZ and Peter VK2EVB. Byron Bay produced Ken VK2DGT, and Coffs Harbour 2PHY Allan, 2YLO John and 2GTM Tracy.

As we sailed into the morning magnificence of Sydney Harbour, VK2UNI Miriam was the last contact from our faithful and sturdy craft, and the handheld became a landlubber again.

To all who added even more pleasure to an already delightful voyage, we thank you. With the help of Sean VK2THT who lent the Callbook, you should all have received a postcard of the ship confirming the QSO. What else can we say, other than it sure beats the hell out of sending messages in bottles.

About the author

Geoff Green retired last year after spending 25 years in Hong Kong as a pilot with Cathay Pacific Airways, and still operates from his QTH there as VS6DA. In the '70s, the airline commenced a service to Perth, Western Australia, and Geoff was able to meet many of the VK6s with whom he had spoken over the years. As a result, Geoff, also a hot-air balloon enthusiast, chose WA to attempt many balloon records and, in 1980, gained the world distance record for hot-air balloons (and a place in The Guinness Book of Records). He also became VK6XB (at times Balloon Mobile!).

With more than 20,000 flying hours, Geoff has now exchanged his 747 for his other flying love, his vintage biplanes. In England he flies his Tiger Moth and a 1937 Hornet Moth. His UK call is G3ZNV.

The "morning net" between VK and VS6 continues to this day, and you will find it on 14.235 at 2330 GMT on weekdays, and a half-hour later at weekends.

* *Lot 1728 DD 221, Sha Ha, Sai Kung NT, Hong Kong*

ar

WIA News

Quarterly Council meeting

As this issue of *Amateur Radio* is being prepared for publication, the July quarterly meeting of the Federal Council of the WIA will meet, over the weekend of 17-18 July.

Important items on this meeting's agenda include the continuing revamp of the Federal company's Memorandum and Articles of Association — which particularly focuses on the structure of the Federal WIA, restaffing of the Federal Office, future editorial and production arrangements for Amateur Radio magazine, and preliminary considerations for the coming year's budget.

Congratulations, Bruce Bathols

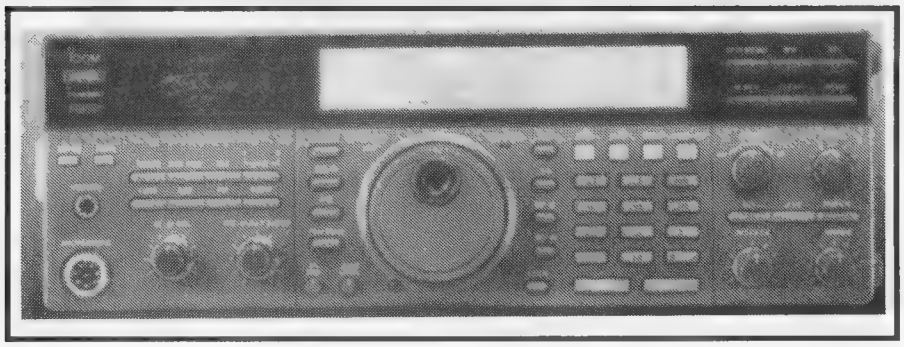
Congratulations are in order for Bruce Bathols VK3UV, production editor of the WIA's *Amateur Radio* for the past year, who has gained the position of editor at Amateur Radio Action magazine.

The best wishes from us, Bruce. We're sure you'll do a superlative job for ARA with fresh ideas and a new perspective, just as you did during your time with AR.

Have you advised SMA of your new address

EQUIPMENT REVIEW
ICOM IC-737 HF All Band All Mode Transceiver

Ron Fisher VK30M checks out the newest medium priced rig from ICOM.*



The new ICOM IC-737 is the first ICOM 12 volt powered transceiver to incorporate an automatic antenna tuner. However, its features don't start or end with this. I would describe the IC-737 as the rig with the super memory system. In this respect alone, it leaves most of its contemporaries in the shade. Just where to place the IC-737 into the scheme of things is a bit more difficult. Is it designed for mobile use or is it a new dedicated base station? I must admit that I am not sure. Over the course of this review I will describe all its features and let you be the judge.

IC-737 Features and Facilities

At first sight I was rather surprised at the size of the transceiver. It is actually 24 mm wider than the old IC-751 although the height is 4 mm less. Overall dimensions are 330 mm wide, 111 mm high and 285 mm deep. In actual volume this is slightly less than the IC-751. Of course we have to make allowance for the built-in antenna tuner but then it doesn't have provision for an inbuilt AC power supply as in the IC-751.

The IC-737 is also jet black in colour. Quite a startling change from the old ICOM colour scheme. I think it looks great. The LCD multi purpose display is the largest and most readable that I have ever seen. The main frequency display numerals are just over one cm high. The rear illumination is bright orange in colour. In contrast the "S" meter is rather dull and hard to read. The display intensity can be adjusted by an internal preset control, but only down, not up.

So much for appearance, let's see what the IC-737 does. The transmitter covers all amateur bands from 160 to 10 metres. The receiver has full general coverage from 30 kHz to 30 MHz (guaranteed range is 500 kHz to 29.995 MHz). Operating modes are SSB, CW, AM and FM. The standard transceiver has three filters, a 2.1 kHz for SSB, a 6 kHz for AM and 12 kHz for FM. Four narrow CW filters are offered as options.

Two operating at 455 kHz give either 500 or 250 Hz band width and two for the 9 MHz IF give the same widths here. ICOM recommend that either one or two of the same band width should be installed. They were not included in our review transceiver so I am unable to comment on their performance.

Of course the IC-737 includes most of the essential features of a 1990s transceiver. Let's run through the list. On the receiver side, there is a switchable preamp plus a 20 dB attenuator. There is fast and slow AGC selection but no provision to switch the AGC off. Also there is no RF gain control. On the QRM management side of things, there is bandpass tuning and a notch filter. The latter is of the audio type as distinct from the more up market IF type but, as we will later see, it is most effective. Tuning has the usual ICOM smoothness. The actual tuning knob seems to be similar to the one used on the top line IC-765 and 781. Normal tuning rate is in 10 Hz steps which gives a tuning rate of 2 kHz per knob revolution. However, if you find this too slow, the stepping rate can be changed to either 20 or 50 Hz. The tuning rate is then four and ten kHz per knob revolution. In a similar way, the one kHz stepping rate initiated by the "TS" button can be programmed to any required step. For instance, a 9 kHz rate can be selected for broadcast band tuning. The tuning rate also changes with the receiving mode. This is ten Hz steps for SSB and CW and 1 kHz steps for AM and FM. However, 10 Hz, or whatever minimum has been selected, can be chosen for AM and FM by giving the "TS" button a push. Of course the IC-737 uses ICOM's superb direct digital synthesiser system which gives remarkably clean tuning. The lack of clicks and plops is noticeable after using older equipment.

On the transmit side the automatic antenna tuner covers all amateur bands including 160 metres and offers high speed tuning. A brand new feature is the provision of two antenna connectors. Two antennas can either be selected by a front panel switch or antennas can be automatically selected by the

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transceiver band selection. A very neat idea.

The transmitter includes a speech compressor to add some bite to the signal. This has a front panel level control but there is no metering to get this right. On the subject of metering you get a choice of two readings only, "S" meter and relative power output. Nothing else. Actually, the red LED transmit indicator blinks with SSB modulation to indicate ALC action.

No VOX is included for SSB. However, the CW operator has been provided with an excellent full break in system. Really the only thing missing for the CW fan is an RF gain control and the ability to switch off the AGC. There is even an electronic keyer built in with speed control on the front panel.

Leaving the best to last, the memory system on the IC-737 is outstanding. There are 101 primary memory channels with recall via a dedicated rotary front panel control. But it doesn't end there. A separate "quick" memory gives another ten "Memo pads" These are for the contest operator to quickly pop in stations to be worked in order. ICOM's band stacking register has been refined and now gives two frequencies on each band when the "Band" button is pushed. It actually works out at 124 memory channels. That will take a bit of beating.

The main circuit board of the IC-737 with the bottom cover removed. The bracket at the top left takes the 455 kHz CW filter. Both CW filters plug in, soldering not needed.

IC-737 On The Air

All of the on air and technical tests were carried out using a matching ICOM PS-15 power supply. The AC power to this is switched from the transceiver "power" switch. The power supply cannot be operated in any other way and no auxiliary DC output terminals are provided. My PS-15 has been modified to overcome both of these problems.

Initial tests on receive showed that the IC-737 has an excellent receiver. It is quiet and the signals "jump out at you'. However, there are several parameters that should be set on initial switch-on. These include, "beep" on or off, one kHz tuning step for AM and FM on or off, (revert to 10 Hz steps). RIT and XIT range selectable +/–1.25 or 2.5 kHz. Scan resume setting allows the scan to stop for ten seconds on a signal or to stop scan altogether when a signal is found. Scan speed can be selected, high or low. Antenna selector may be switched on or off or operated automatically via the band switch. There are thirteen items that can be set in a similar manner. The setting procedure is simple. You hold down two buttons while powering up the transceiver, select the item with the up/down buttons and make your choice with the tuning control.

Back to the receiver. Frequency selection is comprehensive. Use the tuning knob (very smooth) with selectable steps of 10 Hz, 20 Hz or 50 Hz. Use the key pad to the right of the tuning control to enter your required frequency or select an amateur band direct from the same keypad with a single push. The up/down buttons on the transceiver step the tuning in one MHz "chunks" while the up/down buttons on the microphone step the tuning in 50 Hz steps. The main frequency display reads out to 10 Hz and, with the "Split" button, the frequency in the other VFO is also displayed. A very neat idea but with one slight disadvantage. The RIT/XIT readout disappears.

On the subject of RIT, when it is there, it reads out to 10 Hz. Very good, but the main frequency display stays put. I note when changing from upper to lower sideband that the frequency does not change. This is as it should be, but it took ICOM a long time to get around to this. The older rigs changed frequency by 3 kHz and no one ever seemed to be able to tell me why!

Received audio quality through the internal speaker was only fair. The internal speaker is only 55 mm in diameter. With my normal external speaker connected, the audio came to life and it was left connected for all of the remaining tests. The subjective sensitivity appeared excellent but the "S" meter was sluggish with the preamp switched out and almost totally inactive with the attenuator switched in. I think, in fact, that 20 dB attenuation is too much. With only a single attenuator setting, 10 dB would be a better figure. In fact, I found the receiver front end was almost "bomb proof" and the only time I needed to switch out the preamp, let alone switch in the attenuator, was on 80 metres at night.

Unfortunately, there is no RF gain control on the IC-737 so you have to rely on the effectiveness of the AGC. In general this performed very well but the slow decay time was too fast. Again, I suggest that RF gain take the place of the squelch control and that this be relocated as a minor front panel control. AM signals sounded

very clean but with rather limited top audio response. I must admit that ICOM have improved their AM reception quality over the last few years but they still have a little way to go.

No optional filters are offered for either SSB or AM reception. The band pass tuning worked well for SSB and I gather it can be used on CW if two CW narrow filters are installed. The notch filter was effective although the overall audio level appeared to drop when it was switched in (see test section). The notch operates in the receiver audio section and while it only removes the effect and not the cause it is none the less effective. Audio notch filters affect the audio quality much less than the IF types which seem usually to have a wide hole at the top of the notch.

Received audio power output was satisfactory, but tests showed that almost double the power is available with a four ohm load. If you intend to use the rig mobile, look for a four ohm extension speaker. It might make a worthwhile difference.

Transmitter tests were carried out using an HM-12 microphone. This was supplied with the rig in place of the specified HM-36. I am told that they have identical features.

Reports showed that the SSB quality was very intelligible but not startlingly good quality. Reports indicated a lack of low frequency response. I tried an SM-6 desk microphone and this was reported as sounding smoother but still lacking low frequencies.

The speech compressor was effective and added a worthwhile bite to the signal.

The transmitted wave form looked good on the scope and the usual tests for intermodulation distortion showed a slightly better than average result for a 12 volt powered rig. The speech compressor was effective and added a worthwhile bite to the signal without adding any noticeable distortion. There was plenty of microphone gain both with and without the compressor; most of the time the microphone gain was no higher than the 9 o'clock position.

AM and FM modulation were checked and found to be satisfactory. Again the quality was reported as very sharp and lacking low frequencies.

On CW, the IC-737 keyed smoothly with no reported clicks. The in-built keyer was not tested but the manual states it has a speed range of 7 to 41 wpm.

IC-737 On Test

I carried out the usual series of tests on the IC-737 starting with transmitter power output and current drain for both transmit and receive. Power output is variable on all modes via the small "RF PWR" control.

Power Output CW Mode

Band	Power out
160	105 watts
80	105 watts
40	105 watts
30	105 watts
20	100 watts
18	100 watts
15	100 watts
13	100 watts
10	95 watts.

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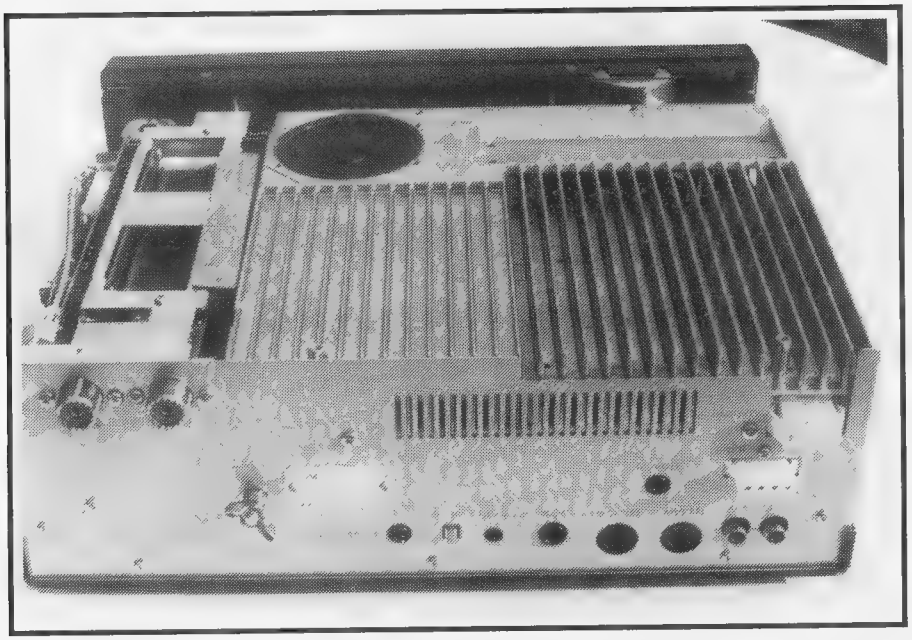
If all this looks Greek to you, perhaps it's because you're not reading the authoritative source — Amateur Radio Action magazine... at your local news outlet every fourth Tuesday.



The uncluttered rear panel and extensive heat sink of the IC-737 — note the two SO-239 antenna connectors.

Power output in the AM mode was spot on 40 watts on all bands. Minimum power for all bands was about 8 watts.

It was noted while doing these tests that the relative output indication on the meter calibrated in % output was, in fact, spot on at the 100 and 50 points but seemed to be rather vague at the 25 and 10 points. Current drain on receive was 1.5 amps with no audio output and 1.8 amps with maximum audio output. On transmit with full CW power output the current drain was 19 amps. All of these tests were carried out using a 13.8 volt regulated supply. PEP output in the SSB mode was slightly more than the above figures.

The IC-737 specification does not give a figure for intermodulation distortion, so the same tests as were carried out on the TS-50 (AR June 93, page 19) were tried. We came up with a figure of -27 dB which is reasonable for a 12 volt powered solid state transceiver. For comparison, a mobile type transceiver which I frequently use in my shack came up about 3 dB worse than the IC-737.

Receiver Tests

Firstly, the "S" meter calibration was checked.

	Preamp out		Preamp in	
S	1	5 μV	1	1.5 μV
	2	6 μV	2	1.8 μV
	3	7 μV	3	2.0 μV
	4	9 μV	4	2.6 μV
	5	12 μV	5	3.4 μV
	8	30 μV	8	10 μV
	9	51 μV	9	15 μV
	+20	400 μV	+20	120 μV
	+40	4 mV	+40	1 mV
	+60	40 mV	+60	10 mV

These test were carried out on 14.2 MHz in the USB mode.

The meter calibration was again checked. In the FM mode on 29.5 MHz.

	Preamp out		Preamp in	
S	9	1.8 μV	9	.5 μV
	+60	5.0 μV	+60	1.5 μV

In other words, the S meter reads full scale on any but the weakest signals. The attenuator was measured at –20 dB.

AGC threshold was about 1 μV and increasing the RF output of my signal generator to maximum increased the audio output by only .5 dB. AGC decay time from S9 was about 1.5 seconds with "slow" selected and about .5 seconds with "fast" selected.

Receiver sensitivity was measured in the SSB mode at 14.2 MHz with the preamp in. I found it to be 0.16 μV for 8 dB SINAD. This is 2 dB less than the specified figure. On the other hand, the AM sensitivity bettered the specified figure by a wide margin. At 2 μV I measured 14 dB SINAD as against the specified 10 dB. The FM sensitivity was measured at 29.5 MHz. It was 0.5 μV for 14 dB SINAD, bettering the specification by 2 dB. The squelch threshold on SSB was 1.6 μV and on FM 0.1 μV. Just as a point of interest, the sensitivity was checked at 500 kHz and 50 kHz in the AM mode. It was 4 μV and 250 μV for 10 dB SINAD respectively. Sensitivity was +/– 1 dB from 1.8 to 30 MHz.

An audio output meter was connected to the external speaker socket and power and distortion were checked. The specified load impedance is 8 ohms but tests were also carried out with a 4 ohm load. At 8 ohms maximum output was 2.5 watts, a fraction less than the specified 2.6 watts. However, distortion was 25% at 2.5 watts. It dropped to 10% at 2 watts. Distortion on SSB, 1 kHz tone at 250 milliwatts was 1.5%. With a 4 ohm load maximum output increased to 3.9 watts and 2 watts power was delivered with a very creditable 2% distortion. An RF input to the receiver of 0.7 μV was needed to produce maximum audio output.

The audio frequency response on SSB was checked. The -6 dB points were at 150 Hz and 2.5 kHz. 2.75 kHz was -8 dB. The curve was very smooth with a gradual roll off at the high end starting at about 1.5 kHz. There was a slight difference in the response between USB and LSB possibly due to the setting of respective carrier oscillators.

I next measured the effectiveness of the notch filter. The first thing noted was the overall audio level dropped 6 dB when the filter was switched in. However, it produced an excellent notch of -23 dB at 1 kHz and -29 dB at 2 kHz. The actual notch was quite narrow and had only a minimal effect on the audio quality. However, the 6 dB reduction in audio output with the filter selected was disturbing.

Next, the overall selectivity was measured for SSB and AM. The SSB measurement was 2.4 kHz for -6 dB and 4.2 kHz at -60 dB. This is 200 Hz wider than the specification but my measuring technique could well

account for this difference. The AM band width at -6 dB was 5.3 kHz with the -10 dB points at 3 kHz. This is a little narrower than the specification. The -40 dB bandwidth came in at 15 kHz, quite a bit sharper than the specified 20 kHz. In spite of this, AM quality sounded quite reasonable, obviously lacking in high frequency response but clean none the less.

Finally, I did an extended test on frequency stability and readout accuracy. Over a test running for several hours, the drift did not exceed 70 Hz. If you need something better than this, then the optional CR-282 high stability master oscillator might be just what you need. Overall, the technical tests confirm the excellent performance of the IC-737.

IC-737 Instruction Manual

The IC-737 instruction book is a sixty page, A4 size book. It seems that 60 pages are ideal to describe the operation of a modern amateur transceiver as other manufacturers seem to run to exactly the same size.

However, the ICOM manual steals a march on many others in that there are two excellent photos that give the positions of most of the necessary adjustment points. These include such things as the BFO frequency adjustments, the S meter S9 and full scale setting points. Also the minimum power adjust point is identified. I didn't try it, but guess it might be possible to bring the power down to genuine QRP levels. The contents of the manual include panel description, installation and connections, basic operation, function operation, memory channels, scans, maintenance and adjustment, options installation, troubleshooting, inside views, specifications and options. As usual there is no technical description. I would score the manual eight out of ten.

IC-737 Conclusions

Since starting to write this review, I have come to the conclusion that the IC-737 is really a base station with the option of using it mobile if you have a car with the room to fit it in. The excellent memory system makes it superb for amateurs who like to jump from band to band and chasing contacts in band packing contests. Pity I will have returned the rig to ICOM before the RD contest.

The overall performance on both transmit and receive is very good indeed but it lacks a few features that would make it into a top flight performer. Just how it fits into the current ICOM line up is another question. Is it designed to take the place of, say, the IC-735?

As far as the amateur market is concerned, I think it is. Of course the 735 is still a big seller for ICOM but not to amateurs. The Chinese Government will buy as many 735s as ICOM can produce and uses them for military communications, not necessarily on the amateur bands of course.

This then leaves the IC-728/729 for mobile operation and the IC-737 as a lower priced base station. This raises two questions. Will ICOM bring out a six metre version of the 737, perhaps called the IC-739? Next will they bring out a version of the IC-728 with a built in automatic antenna tuner? Unfortunately, my crystal ball has gone hazy so I cannot say!

Back to the present. The IC-737 is of course compatible with the wonderful line up of ICOM options such as external antenna tuners, mobile antennas, linear amplifiers and such. The IC-737 is priced at $2613.18 and this includes the built-in automatic antenna tuner. The optional CW filters are $237.80 for the 455 kHz 500 and 250 Hz units and $139.20 and $116 for the 9 MHz 500 and 250 Hz units respectively. Matching external speakers range in price from $69.60 to $214.60 for the SP-20 with built in switchable audio filters.

Three power supplies are available for the IC-737. The PS-15 at $440.80, the PS-30 at $800.40 and the PS-55 at $522.00. As far as I can see, none matches the IC-737 from the point of colour and size. Unfortunately, ICOM give very little detailed information on their options . The IC-737 is certainly recommended as an excellent performing transceiver. It has enough features to please most operators. My thanks to ICOM (Australia Pty. Ltd) and in particular to Duncan Baxter who kindly came down from "Ham Heaven" to arrange the loan of this transceiver.

* *"Gaalanungah', 24 Sugarloaf Road, Beaconsfield Upper, VIC 3808*

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WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of June 1993.

L30852	MR B G J WHITTLE
L30854	MR A RAUS
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L50302	MR T N BROWNLOW
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VK3PA	MR A GREENING
VK3TQ	MR P R WILLMOTT
VK3ZVT	MR D THOMAS
VK4AYN	MR A E JOHNSON
VK4NBG	MR B J TRAVERS
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Technical Abstracts

Gil Sones VK3AUI

160 Metre AM Transmitter

A 2 Watt 160 Metre AM transmitter which generates AM by filtering a Pulse Width Modulated signal is described in the Rad Com May 1993 issue by Peter Asquith G4ENA. The technique used provides a simple low power AM transmitter on a printed circuit board without the need for the usual modulation transformer. The design is intended for the hidden transmitter in hidden transmitter hunts. However, it may have wider appeal as an AM transmitter for local contacts.

The circuit is shown in Fig 1. The audio amplifier stages have a peak limiter and audio filtering to control peak modulation and limit the bandwidth. RV1 sets the peak audio level. RV2 sets the modulation depth.

A hex inverter is used as the oscillator and driver. R12 and C10 convert the square wave from the oscillator into a triangular wave. The DC bias from RV3 sets the threshold point at IC2a. The audio varies this threshold point producing a PWM output. At full power and full positive modulation the output of IC2c and IC2d will be a square wave of 50:50 mark to space ratio. At standing carrier level with no modulation the mark space ratio should be 25:75. At the modulation negative peak the mark space ratio is 0:100. A little fiddling with the pots will result in close to 100% modulation.

The square wave PWM signal drives a logic level input VMOS power FET. L3 can generate spikes and D5 is used to catch any negative pulses. The signal is then filtered by a 7 pole low pass filter which attenuates unwanted harmonics.

The whole transmitter was built on a 100 mm by 50 mm PCB . However, other construction methods could be used. The diode D5 must be a fast recovery type as it has to work in the megahertz region.

The coil winding details for the filter are as follows :-

L3 4μ5 H. 33 turns 0.315 mm Cu wire on Amidon T37-2 toroid.

L4,6 5μ45 H 36 turns 0.315 mm Cu wire on Amidon T37-2 toroid.

L5 6μ9 H 41 turns 0.315 mm Cu wire on Amidon T37-2 toroid.

The 0.315 mm wire is 30 SWG and any wire close to this should do.

Also in the same issue of Rad Com by the same author is a rather neat DF receiver which uses a PCB loop. The receiver circuitry is inside the loop on the same PCB rather like the old portable radios which had the loop aerial wound around the cabinet.

If anyone likes to experiment the receiver loop had about 12 turns around the periphery of a PCB sized 240 mm by 200 mm.

CW Offset Indicator

CW operating with both stations on the same frequency requires some skill with many transceivers. Later designs make life a bit easier by having the sidetone at the same frequency that the beat note of the incoming signal should be. However, older designs, and for those older hams who find it difficult to match the pitch, it can still make for difficulty.

Recently both 73 magazine and the JA CQ magazine have carried designs for a simple tuning aid which lights an LED when the desired pitch is achieved. The 73 Amateur Radio design appeared in the October 1990 edition in an article by F A Bartlett W6OWP. The JA CQ article appeared in March 1993 in an article by JA9MRU.

Both use an LM567 Integrated Circuit which is a Phase Lock Loop IC to drive an LED when the incoming audio from the transceiver is at the same frequency as the PLL. The circuit is tuned to the CW offset frequency which may be the same as the sidetone frequency. If the offset is not the same then the handbook may help or some tests may be needed to find the beat note tone frequency which results when you are on the same frequency as the station that you are working.

Once found, and the LM567 frequency has been set, you only need to tune to light the LED to be zero beat with a station.

The circuit is shown in Fig 2. If the 78L06 regulator is hard to find then try a 5 volt one or a 9 volt one. The important thing is to have a stable voltage so tuning does not wander.

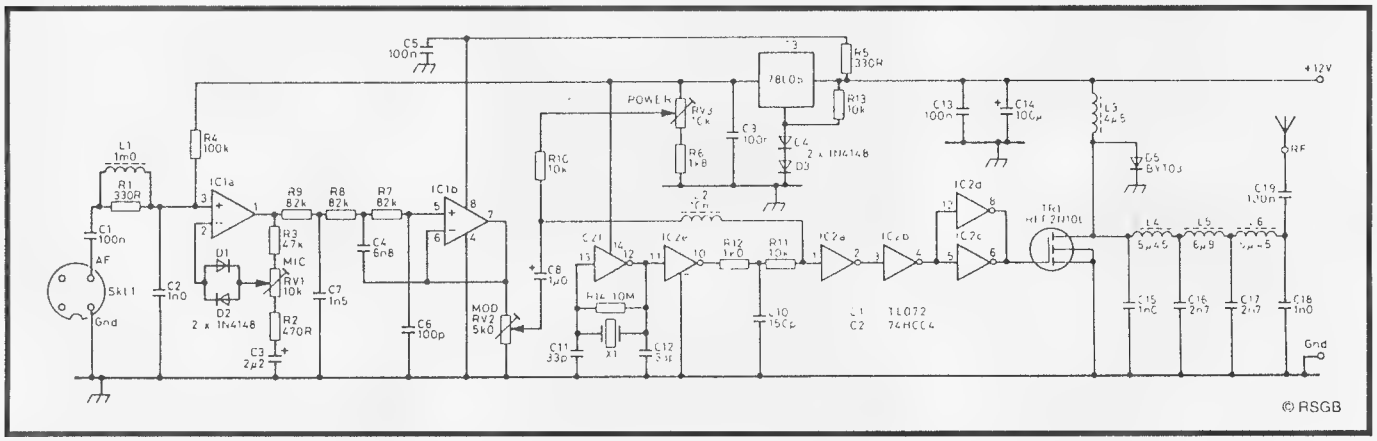

Fig 1: Pulse width modulation is used for the DF transmitter, which has an output of about 2 watts.

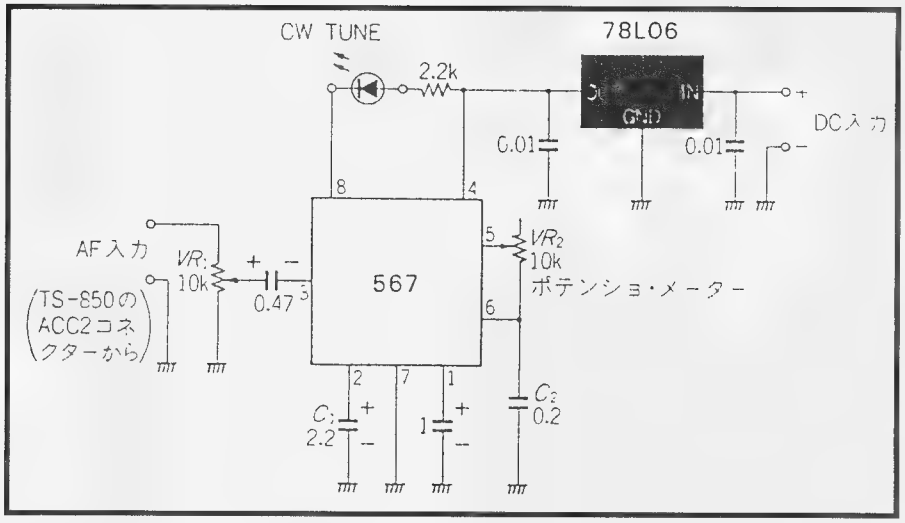

Fig 2. CW Tuning Aid.

Salvaging Surplus Components

Many printed circuit boards full of choice bits are discarded as the cost of repair is often greater than the cost of a new board. The problem is how to recover the choice bits without destroying them.

Conventional desoldering techniques often result in the loss of many parts. This is especially true of Integrated Circuits and Surface Mount Devices. The problem is how to melt the solder on all leads at once so that the component can be lifted. Unequal heating and levering usually results in losses. Fancy desolder stations can do better but you might just as well have bought new bits due to their cost.

A technique for desoldering PCB's appears from time to time which has some merit even though it appears brutal and can be hazardous. I first encountered this method in an early form which cannot be recommended due to the hazards involved. The board was heated with a gas torch to melt the solder and then given a smart rap. Bits and molten solder flew! Hazardous, to say the least. However, a suitably skilled and attired operator could achieve quite a good recovery rate. **Don't try to emulate this technique.** Goggles and full skin cover clothing such as used when welding are essential. The flying solder is very dangerous.

A new version has appeared which minimises the hazards, although molten solder and heaters must still be treated with respect. In particular, wear top quality safety eye protection. Also wear long sleeved and full leg and torso covering heavy duty clothing together with stout footwear. Just one drop of molten solder can be dangerous and most uncomfortable.

The new technique is derived from the equipment used to work with SMD components. A hot air stream is used to melt the solder. For SMD work this source of hot air is a fancy solder station. However, for less precise work such as stripping PCBs there are other ways.

In 73 Magazine for April 1993, C L Houghton WB6IGP in the "Above and Beyond" column shows how to use a Hot Air Paint Stripper Gun as the heat source. These devices enable you to have a controllable source of very hot air. They are widely sold in hardware shops.

The PCB is clamped in a vice which leaves you with both hands free. You use one hand to operate the hot air gun and with the other hand prise the bits free with the prising device of your choice. The gun melts the solder over a localised area of the board containing the parts you want. Most bits can stand the heat for a short time. The trick is to use enough heat quickly to remove them without damage.

The technique succeeds because the bits are only heated for a short time. The PCB will be rather a mess but it was a throwaway anyway. Some practice runs are in order before tackling anything where you really want particular bits.

Remember to wear eye protection and to wear durable clothing covering limbs and torso together with stout footwear. While the method minimises the chance of hot solder and components flying about there is still danger. The hot air gun, whilst relatively civilised, should be treated with respect as it could cause a nasty burn.

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WIA News

New arrangements in Russia

The **Krenkel Central Radio Club of the Russian Federation** has taken over the role of the former Radio Sport Federation of the USSR.

It now administers the PO Box 88, Moscow, QSL bureau operations, as well as arranging contests, competitions, exhibitions and DX-peditions, so a recent letter to the WIA Federal Office under the signature of V. Bondarenko UV3BW, explains.

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The Story of Kingsley Radio Pty Ltd, 1938 to 1945 Part 3

*George W Neilson VK3TES * concludes his most interesting story of the Kingsley Radio receiver, the AR7.*

The Army asked us to modify an Aust Reception Set No 1 to use for direction finding. I did most of the design of this modification and in addition due to the pressures of the time and in order not to disrupt the normal daytime routines worked night shift for two weeks to have access to a lathe to manufacture the various parts for the six units which were made. The first model was designed and built and late one afternoon we took it over to the Domain Gardens opposite the factory to carry out trials. Some officer from Victoria Barracks was going home on the tram and saw us. When he got home he phoned the security people and we were subsequently visited by the Military Police. Fortunately we did not wind up in jail.

On one occasion we had a visit from the RAAF about a problem with Morse code reception where the signal was fading out. In the receivers of those days it was necessary when using the BFO to disconnect the AGC and operate under manual gain control. In the "AR7" the signal detector and AGC detector are adjacent in the same valve envelope. When the BFO is coupled into the signal detector it also is detected by the AGC detector and desensitises the receiver. Because of this the AGC is disconnected when the BFO is turned on. We soon found that the problem was caused by the signal becoming too strong, overloading the receiver rather than fading out. The solution was to use Amplified AGC. This is achieved by using a separate channel to amplify and detect the IF signal thus isolating the AGC detector from the signal detector.

A receiver was modified with an out-rigger chassis mounted on the back containing the separate IF amplifier and detector. This modification worked very successfully. There was also some experimentation in diversity reception where two separate receiver systems are paralleled at the signal detector loads. The receiver with the stronger signal biases off the other receiver.

Allan Doble VK3AMD (left) hands over the restored AR7 Kingsley Communication Receiver, to Mr Boyce Pizzey, Director of the Scienceworks museum.

The RAAF had numerous receivers at base stations each tuned to the one frequency for continuous listening. They approached us about a crystal controlled local oscillator. Perhaps I am influenced by my Scottish ancestry but I always try to keep designs simple. The replacement crystal controlled oscillator consisted of four components mounted in the oscillator coil box, the Crystal, its socket, a bracket for the socket and a 10K resistor. The crystal was connected directly between the grid and plate connections as a Colpitts oscillator using the stray and valve capacities and the 10K resistor became the anode load. The tuning capacitors were connected to separate connections on each coil box and could be isolated. With this oscillator in an appropriate set of coils the receiver was simply tuned for maximum signal. Worked perfectly! This system of crystal control was also used by the Civil Aviation Department.

The shortage of materials always produced problems. We used a long screw of insulating material, known as Erinoid, a casein material, but it eventually became unavailable. A substitute was found to be knitting needles — one had to be very inventive! The suitable size needle was threaded with a die and then cut into lengths. The threading operation resulted in large amounts of swarf in long curly threads. We in our innocence never thought anything about this and in due course it was gathered up by the cleaner and a large quantity dumped in the incinerator. Unfortunately, knitting needles in those days were made of Cellulose Nitrate and that translates loosely into "GUN COTTON" !! The cleaner lit the incinerator and before he had time to move out of range there was a loud explosion which fortunately only blew the lid off, but must have removed ten years from his life! I reckon people got medals for less on active service.

During 1943 the Government started to contact factories engaged in defence work and asked them to start planning for after the war. It seemed that the end of the war was already anticipated. The decision was made that Kingsley would become involved in the manufacture of coils, IF transformers and tuners. Lay Cranch who had considerable experience at Crown Radio in Sydney with the manufacture of these components, joined the firm, together with his coil designer Laurie Fitzgerald.

As described earlier we were making powdered iron cores for use in the AR7, which used over twenty per set. HK went to America and signed agreements with a man named Polydoroff who held patents on an improved type of iron core. These cores had two important improvements over ours. The raw material was again Haematite to

which was added a small quantity of Antimony Oxide which during the reduction process combined with the iron producing an alloy with reduced losses. The milled alloy powder was then given a phosphate coating to prevent the shorting of particles.

We experienced difficulty getting trimmer capacitors. The AR7 used twenty eight in a set of five coil boxes. It was decided that we would have our own capacitor made. We were involved with a manufacturing jeweller in Melbourne, most firms having been switched to war production. Making a variable air type miniature capacitor was a suitable job for them. I had to design the capacitor. In parallel with our iron core production we had been experimenting with making insulators using steatite and the phenol formaldehyde resin. A conventional air trimmer was designed using our insulators. The stator frame was punched from sheet stock to save expensive repetition machining. There was always a problem in the AR7 coil box, the trimmers being hidden so one cannot see as they approach the limits of capacity. A stop was designed into our trimmer at minimum (anticlockwise) or maximum (clockwise) capacity.

It was decided that we would market a tuner for radio receivers using iron cores for tuning instead of the conventional tuning capacitor. I was given the job of designing this unit and a prototype was built for presentation at an exhibition which was held in Sydney. To make maximum impact this unit was made dual wave but the subsequent production model was broadcast only.

I was not given any specification, which was usual in those days. I decided therefore that the unit had to be as good as the equivalent capacitor tuned-unit. HK had brought back from America a small MW receiver using permeability tuning. This had the cheapest and nastiest possible tuner and I vowed that we would never make anything like that.

The biggest problem found was that the non-linear tuning curve caused most of the stations to be crammed up at the HF end. Capacitor units were better, so this was one area which we had to improve. The

Iron Core Production. The heavy core press room at Kingsley Radio Pty Ltd, for production of large shapes and slugs. The smaller cores were produced on high speed automatic presses.

manufacture of iron cores to give a frequency range of three to one or nine to one inductance change in the aerial coil was not easy and required special techniques. To get the required permeability it was necessary to press the cylindrical cores sideways rather than the normal end-on. As the iron particles tend to flatten, sideways pressing caused the particles to lie in the most favourable direction. This tends to preclude any grading of the core similar to the way the plates of the capacitor are shaped. The cross section of the pressed cores cannot be made round because of die problems but were ground round after pressing.

The solution became mechanical and the variable pitch drive screw was devised. For the prototype which went to Sydney a pencil line was drawn on a quarter inch diameter shaft and our toolmaker cut the "Acme" thread with a hacksaw. For the production model a "Hercus" bench lathe was modified to use a cam driven from the lead screw to drive the saddle with a large spring making the return stroke. The cutting tool was fitted with automatic feed and spindles were made in a semi-automatic operation. The pitch of the screw matched the tuning curve of the aerial coil giving linear frequency tuning. As the frequency range of the oscillator was only about two to one conventional cores were used with two different cores combined end on end to give correct oscillator tracking. Adjustable copper tabs were used for low frequency trimming of the inductor with conventional trimmers for the high frequency end. After the war this unit was very popular and sold in large numbers to home builders.

Having become involved in the manufacture of iron powder (some even being sold for medicinal purposes) it was a likely step to move into the manufacture of copper powder for use in porous bronze bearings. A copper powder plant was set up using electrolytic deposition of copper on stainless steel plates. A large low voltage 1500 A rotary generator supplied the power. Suddenly we were involved in using two inch by one inch (5 *x* 2.5 cm) busbar conductors instead of hook-up wire! We learnt the hard way how not to demagnetise the auxiliary generator supplying the field when shutting it down.

By now we were making numerous kinds of cores including toroids and pot cores. This led to a contract with the then PMG to supply Tone Oscillators for carrier telegraph operation. These were single frequency tone oscillators designed for rack mounting and covered a range of voice frequencies at 240 Hz intervals. They used a pot core with adjustable inner core for tuning.

American aircraft in the area by now were using VHF radio communication around 120 MHz and the RAAF had no matching ground station equipment. A quick fix was to adapt aircraft transceivers — such as the SCR522 set with four switched crystal controlled frequencies — for ground operation. The RAAF technical staff built a prototype mains operated power supply for the SCR522 and specified all the components. We were contracted to make a batch of these and had all the parts supplied to their specifications. The first unit was submitted for inspection by AID — Aeronautical Inspection Directorate. Sadly the power failed, being low in volts. Then started a saga which surprisingly did not end up in the High Court. The transformer manufacturer and the RAAF, with us in the middle, haggled about whether the transformer conformed to the RAAF spec. There were exhortations to use dynamometer voltmeters etc but it transpired that the RAAF had built their prototype using a Variac as the transformer and then measured the voltage, which they then specified. Of course the source impedance of the production transformer in no way compared with the 1 kVA variac!

I left Kingsley when the war finished to run my own business so was not involved in their post war production although I was contracted to make test equipment for their production line.

It was a sad day when, in their post-war prime Howard Kingsley Love passed away. He was the inspiration and driving force of Kingsley Radio Pty Ltd and the shareholders were not prepared to carry on the business without him.

Prior to 1924, Kingsley Love had the amateur call sign 3BM. After the war he obtained the call sign VK3KU.

Vale HK, VK3KU.

Scienceworks (Science Museum Victoria)

In August 1992 Mr. Geoff Holden, curator of Electronics at Scienceworks, which is now located at Spotswood, expressed the wish that the museum could acquire a good example of the justly famous "Kingsley" AR7 communication receiver. This would be held, but not necessarily always on display, as part of the reference collection of uniquely Australian designs and inventions.

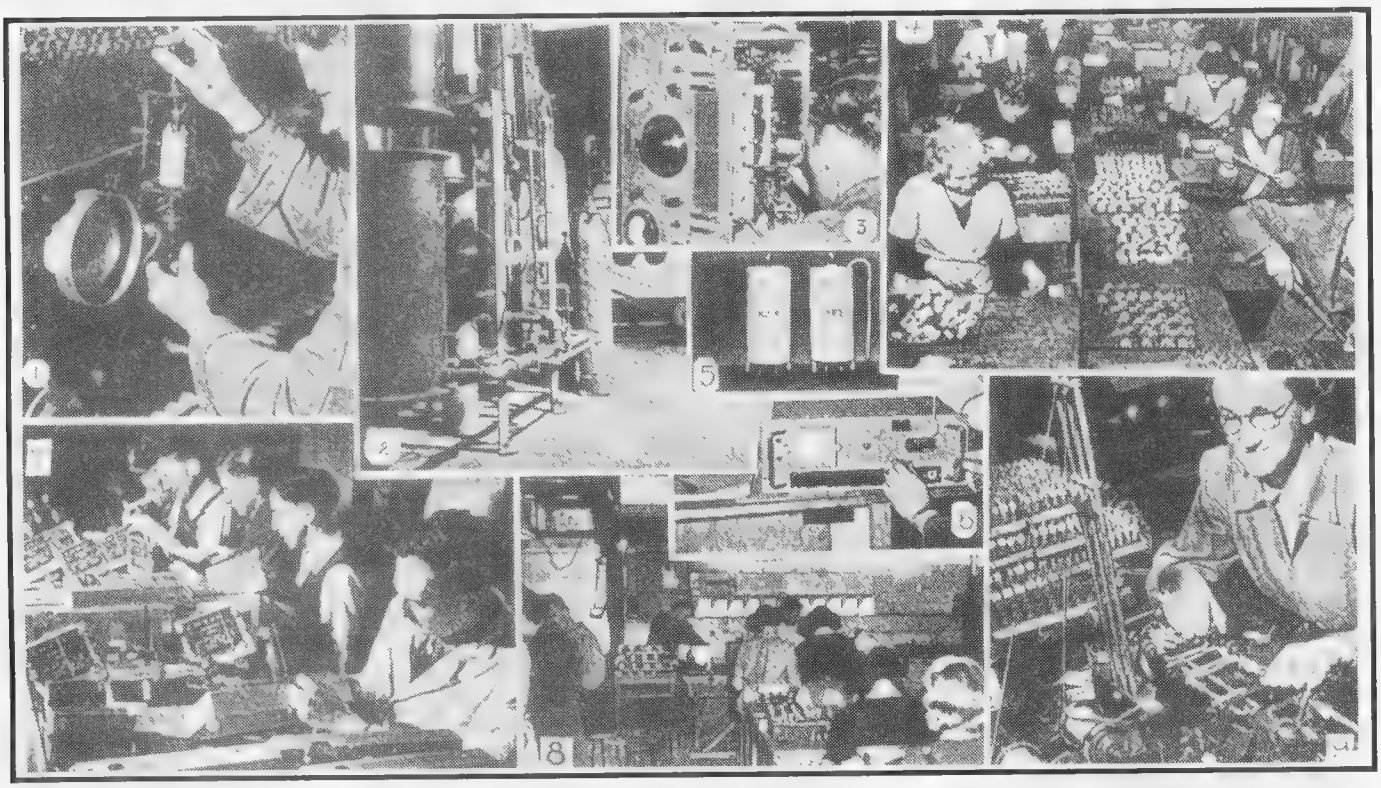
Allan Doble VK3AMD placed a "wanted" advertisement in the September 1992 edition of "Amateur Radio", and received such a generous response that a completely restored and fully operational AR7 was handed over to Mr. Boyce Pizzey, director of the Museum on 25th November 1992.

Major gifts were:

Kevin Judd VK3ZDJ — Power Pack, speaker and rack.
John Beverin VK3CMO — AR7 Receiver.
Bill Trenwith VK3ATW — Coil Boxes.
Lay Cranch VK3CF — Distribution Manual.

Milton Crompton VK3MN and Doug Richards VK3CCY contributed some power pack components.

The hard work was done by Harry Mauger VK3KAE who repaired, cleaned up, painted and tuned up the rig so that it looked like new, and



1. IF testing with FM oscillator and Cathode Ray Oscillograph; 2. Section of Furnace Room for reduction of iron powder; 3. Aligning Kingsley K/CR/11 (AR7) Communications Receiver; 4. Section of one of Kingsley's IF and coil process lines; 5.Typical standard IF transformers; 6. Testing Crystal Calibrator Unit as supplied to RAAF; 7. One section of "Ferrotune" production line; 8. Portion of the Communications Equipment production section; 9. One of the battery of universal precision coil winding machines. ***Photographs from the Kingsley Radio components catalogue. Kindly provided by the estate of the late Lay Cranch, VK3CF.***

worked like new, in fact, at the time of the handover, CW from the Perth coastal station formed a background to the short speeches. All ex RAAF personnel who have seen the receiver have confirmed that the restoration is almost uncanny, a great tribute to Harry Mauger's skill.

Present on the day of the handover were:
Mr Boyce Pizzey and Mr Geoff Holden of the Museum, and a representative group with detailed knowledge of the receiver's manufacture and use.

This group comprised:
George Neilson VK3TES who worked for Kingsley Radio from before the AR7 was born, until after its wartime production of 3,200 sets was completed.

Bill Gronow VK3WG who, as a Wing Commander in the RAAF was responsible for overseeing the production of the RAAF's requirements for radio and radar.

Quintin Foster ex VK6QF who commanded one of the until recently secret RAAF "Wireless Units" whose task was to monitor and translate Japanese armed services traffic using AR7 receivers.

Arthur Evans VK3VQ who commanded another of the RAAF "Wireless Units".

Jack Bleakley who has written the recently published book *The Eavesdroppers,* Australian Government Publishing Service, (Canberra:1992), which details the work of these units and in which both Quintin Foster and Arthur Evans are named.

Harry Mauger VK3KAE who assembled and tested the complete receiver.

Ron Fisher VK3OM who photographed and recorded the proceedings on the day of the handover, and Allan Doble VK3AMD.

Opening the proceedings Boyce Pizzey, director of Scienceworks said what a great pleasure it is to have the "Kingsley Team" bring this particular piece of Australian inventiveness and technological history into the museum. "This is perhaps the first major acquisition we've had since Scienceworks started up, so it's a red letter day for us and as part of the opening of the new Communication Program it's really quite an important event". He thanked all for their contribution, and asked Allan Doble to take us through the story of the Kingsley AR7.

Allan Doble then outlined how Geoff Holden had said Scienceworks would really like a nice working example of the Kingsley AR7 receiver. So it started with an innocent 5 line "wanted" advertisement in *Amateur Radio.* The response was overwhelming. "We couldn't accept all the offers, but we did get a receiver, and powerpack, and coils from a group of people. And a good friend, Harry Mauger, put the whole thing together". He introduced Jack Bleakly, Arthur Evans, Quintin Foster and Harry Mauger. He then invited Bill Gronow who was the RAAF's top man technically for the overview of radio communication and radar requirements for the RAAF, to review the history of the AR7.

Bill Gronow described how signals organisation evolved from a few officers, several NCOs, and devoted airmen, all very interested in radio, but having very little money at their disposal, and very limited equipment. When World War II commenced, 152 members of the Wireless reserve, mainly amateurs, joined up and the Signals Section got off to a good start. In 1928 the RAAF decided to foster local manufacture, and specifications were written for transmitters, receivers, and transceivers and contracts were ultimately placed with local contractors of whom Kingsley Radio was one. He reviewed earlier Australian Radio Receivers, of which there were six, before the AR7 which covered 138 kHz to 25 MHz, and became a very good, locally produced base station receiver.

Allan Doble then formally presented the AR7 to the Museum and commented that it hasn't cost anybody anything except time and work, and it might be seen as a tribute to the wonderful radio industry this country once had, and to the men who used the receiver in very trying conditions.

Boyce Pizzey concluded the proceedings by again expressing his appreciation of the gift.

* *48 Garden Street Blairgowrie Vic 3942*

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WIA News

Amateur Radio helps Navy base Celebrate

Canberra RAN club station VK1RAN was given permission to operate mobile from the grounds of the HMAS Harman Naval Communications Station during its 50th Anniversary Open Day on Saturday, 3 July.

Operated by members of the Naval Amateur Radio Society (RNARS), VK1RAN contacted stations around Canberra, in Adelaide, Perth, Sydney — including RNARS station VK2CC at Snapper Island, and Brisbane — including the RNARS station VK4RAN onboard the museum ship, HMAS Diamantina at South Bank.

Several hundred former Navy communications operators and technicians gathered for the 50th anniversary, touring the base during the Open Day.

VK1RAN operators were Peter Ellis VK1KEP, director of RNARS Australia, committee members Glen Dunstan VK1XX and Margaret Nally VK3QU (who travelled from Melbourne for the Anniversary), and Gerry Aubert VK2CGA, from Sydney.

Under the Navy's regulations, the approval for the VK1RAN operation at HMAS Harman came from the top: the Chief of Naval Staff, Vice Admiral Ian MacDougal, on advice from Commanding Officer, Commander George Spence.

The new Spectrum Management Agency approved the temporary mobile operation of the club station away from its normal address.

VK1RAN went to air from a long wire HF antenna sloping 45 degrees from a 30 metre fixed tower, with rigs set up at the side door of a passenger van, parked in the grounds.

Quickie Transistor Checker

*Brian J Field VK6BQN * describes the construction of a very simple transistor checker.*

Almost all parts can be found in the junkbox and none of them are critical. The principle of operation is that the transistor acts as an oscillator using the primary of a low voltage transformer. The secondary (240 V winding) drives a meter to indicate oscillation. If the transistor is a dud nothing happens and the meter doesn't move. Some versions of this device have done away with the meter and use a NE51 neon bulb. I used the meter only because it is more sensitive since a neon requires around 60 V to fire.

The transformer I used was 10-0-10 V but a 6 V or 12 V either side of centre tap should work. The only thing is to make sure there is something on the 240 V winding that can be measured. Use your scope initially to make sure the device oscillates by connecting the probe to the total of the low voltage side and if necessary adjust the value of the 8 μF capacitor to whatever is a suitable value for reliable oscillation.

Once you are sure it is oscillating it is now a matter of getting a meter to indicate. This is best done experimentally depending on the meter sensitivity and the voltage obtained. There are some hefty spikes but since the meter is only going to read average voltage it should be set to about 30 V full scale. Note also that only a single diode rectifier is used so that the average voltage is going to be a lot less than the peaks seen on the scope.

Nothing in the construction is critical. I made a rectangular piece of

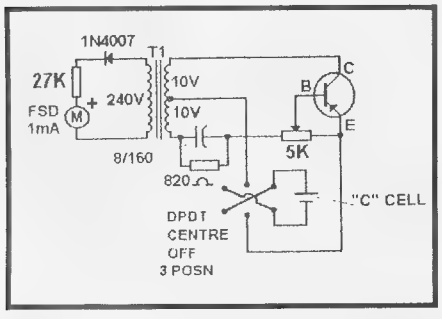

Figure 1 — Schematic Diagram

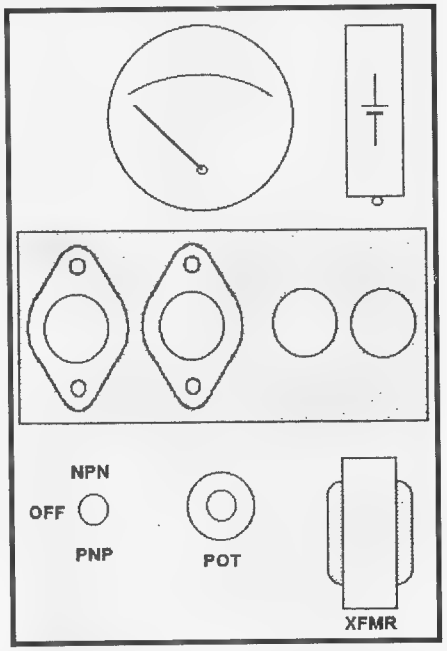

Figure 2 — XRAY View, Front Panel (not to scale)

bakelite to mount the various sockets and cut out the square hole in the panel large enough to clear a TO3 transistor so that nothing touches the case. Mount the sockets for TO3 and TO66 with round head screws so that they will touch the transistor case to make the collector connection. I also reamed out the holes for E and B on these two sockets since they were so nice and snug on brand new devices. Not really amenable to testing devices with solder traces on their pins. The third socket is 3 holes in line for testing TO220 and similar packages. The pinout almost always has the collector in the centre so it doesn't matter which way the other two leads are connected. Alligator clips can be used to cover all contingencies. Finally the switch must have a centre off to avoid draining the battery.

In operation it is merely a matter of plugging in the transistor and twiddling the pot to get it to oscillate. Make sure to hold the case down on power types onto the screws to make contact. Some devices are touchier

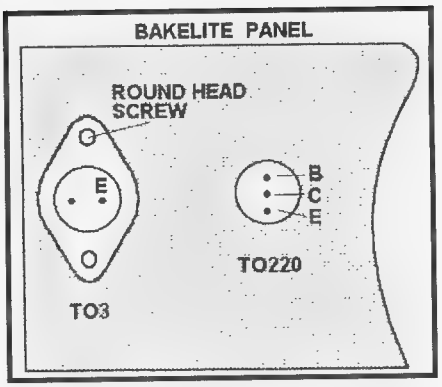

Figure 2A — Location of Power Transistors

than others but most seem to give something over a similar range of rotation. 90% of devices will fit the sockets as shown.

Tech Teacher's Notes

1. *The author used an ordinary electrolytic for the 8μF capacitor. More reliable operation with polarity reversals when switching from NPN to PNP would be obtained with a bipolar or a plastic dielectric capacitor.*
2. *At one extreme of the pot travel the Base Collector junction may be damaged if reverse polarity is applied. The current is limited only by the transformer winding resistance and the internal resistance of the cell. The author has not experienced trouble but the possibility exists.*

Materials List

820 ohm resistor
27K resistor
5K potentiometer
Filament Transformer (must be centre tapped)
Meter
1N4007 Diode
8 μF Capacitor
DPDT centre off switch
C cell
Jiffy Box
Transistor Sockets
Bakelite Strip 100mm X 40mm

* *PO Box 466, Hillarys WA 6025*

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Book Review
History of International Broadcasting

By James Wood
Reviewed by Bill Rice VK3ABP
Published December 1992 by the IEE (Number 19 in the series IEE History of Technology) ISBN 0 86341 281 5. 258 pages. Our copy direct from IEE. Price (in UK) 30 pounds sterling.

This is a book which will be of interest to all radio amateurs, since most of us began our radio career as short-wave listeners. Further back in history the very broadcasters to whom we listened were frequently amateur stations before they evolved into larger organisations.

As might be expected of a book published in the UK, the organisation most fully described from its beginnings in 1922 is, of course, the BBC. At the time of publication, the UK was the fifth largest overseas broadcaster, with about one-third the program hours per week (756) of the leading country (USA, with 2368). The USSR was second with 2257 (undoubtedly different now!), China 1517, and the (then) two Germanys 1311 between them. Australia barely rates a mention (in fact, the index has no entry for Radio Australia), but Canada, Switzerland and many others are likewise ignored. These omissions are mentioned apologetically in the preface.

A more surprising omission is of the part played by an amateur (Gerald Marcuse G2NM) in the genesis of BBC short-wave broadcasting in 1927. John Clarricoats' book, "World at their Fingertips", would appear not to have been one of Mr Wood's references!

Apart from occasional diversions into the technology of high power transmitter construction (the author's own field) most of the book covers in excellent detail the evolution of broadcasting (especially HF) as a means of influencing public opinion. While contrasting the initial American emphasis on entertainment with the British use for "social manipulation" (Wood's words), he shows how most countries developed effective broadcast propaganda systems — both political and religious. These played their first part in the Italian invasion of Ethiopia in 1935, evolved tremendously during the war years 1939-45, and probably reached their peak in the Cold War between 1946-1986. Jamming by the USSR of such programs began in 1948 and eventually ceased in 1988 with the collapse of Communism. Wood makes a good case for Western broadcasting propaganda being a significant factor in this event.

And what of the future? An appendix entitled "Television, the Gulf War and the Future of Propaganda" makes reference to "Over the Horizon Television". The sky, it seems, is not the limit!

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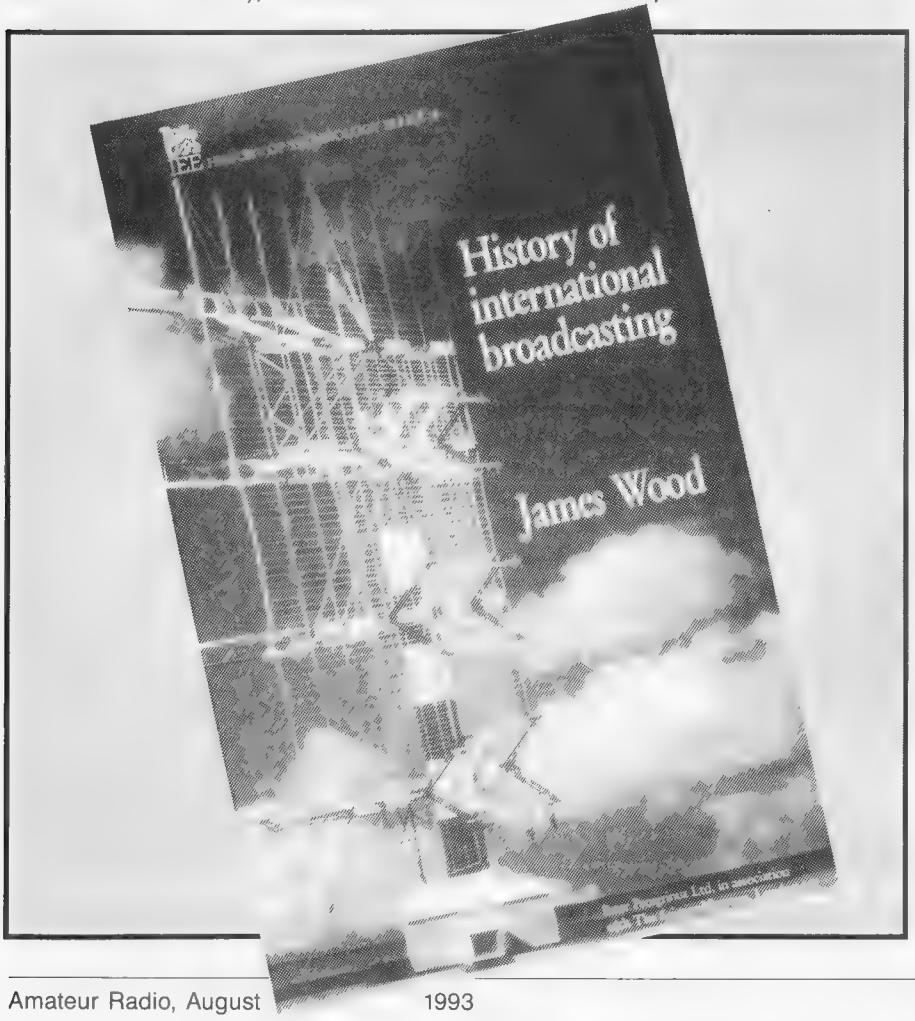

WIA News

WIA Exam Service Statistics

The pass rate at licence examinations rose by almost 11 per cent in the first four months of 1993 compared to the same period last year, while the number of candidates per event fell by nearly 25 per cent and the number of events jumped by over 63 per cent.

During January to April 1992, 111 examination events were held, while 181 were held in the corresponding period this year. There were 477 candidates who sat exams in the those four months of 1992, compared to 584 in the same period of 1993 — a jump of 22.43 per cent.

Similarly, the number of subjects rose in 1993 — 940 subjects this year, compared to 773 last year; a rise of 21.6 per cent. However, the number of candidates per event fell from 4.3 in 1992 to 3.23 in the first four months of this year, a drop of 24.88 per cent.

There was a heartening rise in the pass rate, from 49.03 per cent in 1992 to 59.68 per cent in 1993; an increase of 10.65 per cent. The number of subjects per candidate hardly varied, being 1.62 in 1992's first four months, and 1.61 this year. The number of subjects per event fell from 6.96 to 5.19, or 25.43 per cent.

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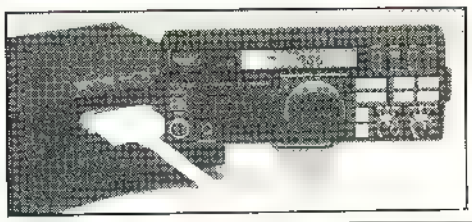

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This modification kit allows the front panel of the FT-747GX to be mounted away front the body of the transceiver. Price includes installation on your FT-747GX
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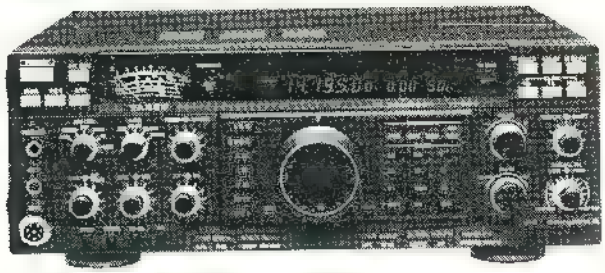
$349
SAVE $100



FT-990 DC Version
(Requires 13.8V)
Cat D-3255

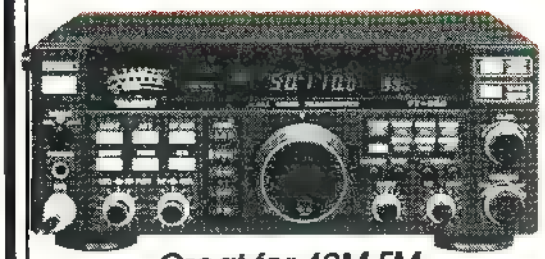
SAVE $200

Only $2995

2 Year Warranty
FT-990 H.F All-Mode Base Transceiver

The FT-990 offers many of the advanced features of the legendary FT-1000, yet in a more compact and economical base-station package. Its excellent front panel layout, together with clear labelling a large back-lit meter and an uncluttered digital display provides very straightforward operation. The receiver performance is excellent with a wide dynamic range front-end circuit and two DDS's providing a very low noise level and excellent sensitivity over the 100kHz to 30MHz range. Transmitter output is 100W on all HF Amateur bands (SSB, CW,FM) with high duty cycle transmission allowed
An internal auto antenna tuner with 39 memories is a standard feature, while the customizable RF speech processor and Switched Capacitance Audio Filtering facilities are unique to the FT-990. Other features include IF Shift and IF Notch, IF bandwidth selection an effective adjustable notch filter, 90 memories and one touch band selection. Microphone optional extra

EXCESS STOCK CLEARANCE! -BELOW COST!



Great for 10M FM repeater operation!

UNBEATABLE VALUE **$1695**

2 Year Warranty
FT-650 6m, 10m, 12m 100W Transceiver

Now's the time to get ready for the summer DX season on the 6m and 10m bands and the Yaesu FT-650 mobile transceiver allows you to do it in style. Its all-mode operation, 100W RF output (SSB, FM, CW), and continuous 24.5 to 56MHz receiver coverage allows you to hear signals outside the Amateur bands, so you can track the rising MUF and work stations as soon as the band opens. The use of 3 DDS's and a 2-stage low noise RF pre-amp results in a very quiet and sensitive receiver (SSB/CW 0.125uV). To cater for the FM enthusiast, the FT-650 provides repeater offsets, as well as exceptional 0.16uV (12dB SINAD) sensitivity. Other features include selectable tuning steps manual/auto IF notch filter, RF speech processor, IF shift control, 105 scannable memories and an effective noise blanker. Includes MH-1 hand microphone
Cat D-3250

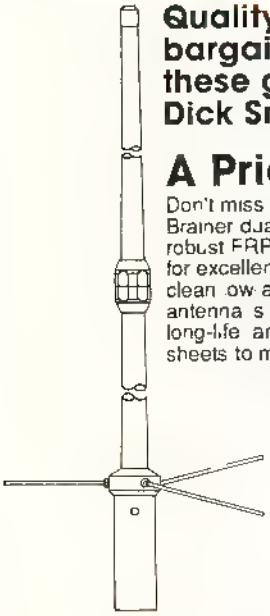
B 1531

Pick Up More With These BRAINER Bargains!

Quality Japanese antennas at a bargain price. Don't miss out on these great specials, exclusive to Dick Smith Electronics!

A Price Breakthrough!

Don't miss our best ever prices on these high performance Brainer dualband 2m/70cm base station antennas. They use robust FRP (fibreglass reinforced polyester) tubing construction for excellent all weather operation and a ground plane for a clean low angle radiation pattern which maximises gain. Each antenna is rated at 200W, uses stainless steel hardware for long-life and comes with detailed locally-written instruction sheets to make construction easy.



Cat D-4830

Compact GST-1 2m/70cm Antenna

Frequency	144-148MHz, 430-450MHz
Gain	6dB on 2m, 8dB on 70cm
Length	2.5m
Type	2 x 5/8 wave (2m) 4 x 5/8 wave (70cm)

$179 SAVE $20

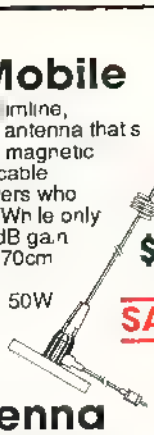
BRAINER

Long Range GST-3 2m/70cm Antenna

Frequency	144-148MHz, 430-440MHz
Gain	7.9dB on 2m, 11.7dB on 70cm
Length	4.4m
Type	3 x 5/8 wave (2m) 7 x 5/8 wave (70cm)

Cat D-4835 **$269** SAVE $10

2m/70cm Magnetic Mobile



The black TM-723M is a slimline, compact dualband mobile antenna that's supplied with a low profile magnetic mount and low-loss coax cable making it ideal for city drivers who can't use a long antenna. While only 0.7m high it provides 1.7dB gain on 2m and 4.7dB gain on 70cm and has a conservative maximum power rating of 50W.

Cat D-4812

BRAINER **$69.95** SAVE $20

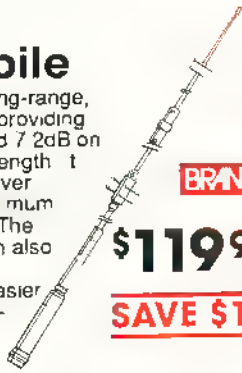
2m/70cm Mobile Antenna

The ST-7500 is a high quality medium sized dual band antenna that uses a ground-independent design and a stable stainless steel whip structure to provide excellent mobile results. It's just 1m long, yet provides approximately 3dB gain on 2m and 5.5dB gain on 70cm with a maximum power rating of 150 watts. Requires an SO-239 antenna base or SO-239 magnetic base.

Cat D-4810

BRAINER **$69.95** SAVE $10

2m/70cm Hi-Gain Mobile



The ST-7800 is our best long-range, dual band mobile antenna, providing high gain (4.5dB on 2m and 7.2dB on 70cm), while only 1.5m in length. It incorporates an inbuilt tilt-over mechanism and has a maximum power rating of 150 watts. The ground-independent design also allows the use of gutter or boot/bonnet brackets for easier mounting. Requires an SO-239 antenna base.

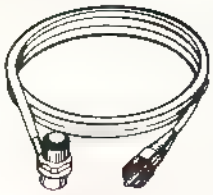
Cat D-4815

BRAINER **$119.95** SAVE $10

SO-239 Base/Lead Set

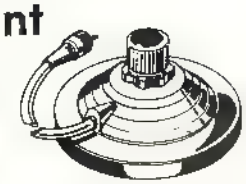
A convenient way to mount a PL-259 type antenna. This quality Japanese SO-239 base is pre-wired with 4m of low loss coax cable and has a PL-259 already fitted for connection to your transceiver.

Cat D-4052



$24.95 SAVE $5

SO-239 Magnetic Antenna Mount



A powerful Japanese magnetic mount for use with PL-259 antennas. It's supplied with 4m of quality coax cable and fitted PL-259 plug. Suits small to medium VHF/UHF antennas such as the ST-7500.

Cat D-4520

$59.95

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ALARA

*Robyn Gladwin VK3ENX**

Treasurers Together

When office-bearers in an organisation change, it is not often that they have the opportunity to hand over the reins in person. Val Rickaby VK4VR, the ALARA treasurer since September 1986, recently travelled to Dalby, Queensland to meet Margaret Schwerin VK4AOE the incoming treasurer. They are pictured on this occasion, the only time two ALARA treasurers have been photographed together. ALARA members thank Val and her OM, Brian VK4RX, most sincerely for their contribution to our Association.

New Zealand YL on Packet

In the latest edition of the WARO Bulletin, Ann ZL3TNT has written an article about her introduction to the world of Packet Radio. She was encouraged by her OM, David ZL3AI, and has now had packet connects with 14 countries besides New Zealand. She lists some of the advantages of the packet mode. She can send messages at a time that suits her. The person she is trying to contact does not have to be near a radio. She can correct all her typing errors before sending the message and she has LOTS of new friends.

However, it was her last paragraph that led me to feature her work in this column and I quote: *"There does not seem to be a lot of YLs active on Packet, but those of us that are, tend to share contact addresses. So, if you have a computer, and want to try something a bit different in radio, then why not get Packet up and running and join us. We would love to hear from you. My packet address is ZL3TNT@ZL3AC.#80.CHC.NZL.OC."*

Silent Key

While still in New Zealand, ALARA extends our deepest sympathy to the family of Dr Brenda Shore ZL4OQ, a sponsored DX member, who passed away on 18th June, 1993.

ALARAMEET Update

Every three years, ALARA holds an ALARAMEET or gathering of members, OMs and harmonics. It is an opportunity for those attending to put a face to a well-known voice on the radio, or for old friends to catch up on the latest news in person. This year, the ALARAMEET will be held in the Central Victorian town of Castlemaine on 1st, 2nd and 3rd October. The Co-ordinator is Margaret Loft VK3DML, who has worked very hard for almost 2 years to organise the venue, activities and accommodation necessary to make the event a success.

Margaret now has 88 names on the list of those wishing to attend and interest has been shown from as far afield as Germany, USA, Japan and New Zealand as well as Australia. Kathy VK3XBA and Chris VK3LCR have kindly consented to act as drivers for two groups of YLs who are able to attend only on the Saturday and do not wish to stay overnight. As it is now less than 8 weeks to the ALARAMEET, Margaret would appreciate knowing any last minute changes participants need to make to either accommodation or catering arrangements so that she can give final numbers to the organisations in the region who are providing the various services and activities.

**Box 438 Chelsea 3196 VK3ENX@VK3YZW*

Margaret Schwerin VK4AOE and Val Rickaby VK4VR recently travelled to Dalby, Queensland to meet.

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Club Corner

Radio Amateurs Old Timers Club

A reminder is given that the August QSO parties will be held on Monday 2nd on 3.5 MHz and Monday 9th on 7 MHz. Details are in OTN March 1993. Members and other listeners to the Club's broadcast on the first Monday of each month are reminded that we now repeat the broadcast in the evening at 8.30 pm local time on 3.635 MHz subject to QRM. It has been heard in VK3, 4, 5 and 7. Although it has not been responded to as actively as we had expected we will continue with it for a while yet. Our July 5 broadcast included a list of the VK stations worked with 5 watts CW from Heard Island in 1947/48/49 by Alan Campbell Drury VK3CD who operated there as VK3ACD.

The next issue of the club magazine "OTN" will be published in September. Results of the two August QSO parties will be published in a later issue of "Amateur Radio".

Allan Doble VK3AMD

Moorabbin and District Radio Club

A dedicated group of younger members put in many hours of hard work at the club station (VK3APC) participating in the Novice Contest. Operators report that the conditions seemed more difficult than in previous years and that most contacts were made on 80 metres. Friends of the club are reminded that all correspondence should be directed to our new Post Office box which is PO Box 58, Highett VIC, 3190.

Allan Doble VK3AMD

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WIA Divisional Bookshops

The following items are available from your Division's Bookshop
(see the WIA Division Directory on page 3 for the address of your Division)

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Ant. Compendium Vol 2 Software 5.25" IBM Disk	BX293	$20.00
Antenna Collection — RSGB	BX391	$44.00
Antenna Compendium Vol 1 — ARRL	BX163	$22.00
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Antenna Impedance Matching — ARRL	BX257	$30.00
Antenna Note Book W1FB — ARRL	BX179	$20.00
Antenna Pattern Worksheets Pkt of 10	BX902	$3.00
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Cubical Quad Antennas — Haviland — 1993	BX041	$37.50
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HF Antennas for All Locations — Moxon	BX188	$45.00
G-QRP Antenna Handbook	BX452	$22.50
Novice Antenna Notebook — DeMaw W1FB — ARRL	BX162	$16.00
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Physical Design of Yagi 5.25" IBM Disk	BX388A	$20.00
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Practical Wire Antennas — RSGB	BX296	$28.00
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Reflections Transmission Lines and Antennas — 5.25" IBM	BX348A	$20.00
Reflections Transmission Lines and Antennas — ARRL	BX348	$40.00
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Smith Charts S/Scale 1 SET co-ord Imp/Admir Pack of 10	BX901	$6.60
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$6.60
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Transmission Line Transformers — ARRL	BX329	$40.00
Vertical Antenna Handbook — Lee — 1990	BX284	$22.00
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AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net
Control station VK5AGR
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Frequencies: (again depending on propagation conditions)
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Secondary 3.685 MHz (Usually during winter).

Frequencies +/– 5 kHz for QRM.
AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Australia, addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Software Review

Last month I mentioned an excellent little utility called ITSORT. It is part of a suite of software that is being circulated around AMSAT circles via AMSAT-NA. The suite also contains utilities to generate up-coming passes of various satellites in chronological order and a number of files of interest to users of the Kansas City Tracker and the QUICKTRACK tracking program.

ITSORT will be of great value to users of INSTANTRACK which is probably the most popular of all tracking programs INSTANTRACK has one major short-coming. Users cannot easily re-arrange or edit the satellite data base. It is a very clumsy operation to move satellites around or keep all the amateur satellites together etc. It usually involves quite a bit of deleting and re-entering of data. I had gone to the trouble of doing this some time ago. What a difference this ITSORT utility makes.

It allows you to use your favourite screen editor to do what you will with the satellite data base. It comes with an easy to read document. When you have installed it in your IT directory, you type ITSORT and it goes to work creating a file called SATNAMES.LST.

This an ASCII file which can be edited to re-arrange the satellite names into the order you prefer. You may like to have the first column reserved for amateur satellites, the next for weather satellites, the next for scientific satellites etc, or you may have a few favourite satellites you would like to be in the first column or on the first page. Having done the editing you save the new file as (say) C:/IT/SATNAMES.LST, overwriting the original. When you run ITSORT again it will use the new file to re-arrange the satellite data base in IT. You can use a "*" or a "-" to reserve a few places here and there if you like but it really doesn't matter as it's so easy to edit the file at any time.

Now when I run INSTANTRACK I'm presented with a satellite file which fills the first page with the ones I'm most interested in and the odds and sods are relegated to the following pages.

Whilst on the subject of software, I must mention the almost breathtaking array of software offered by AMSAT-VK. Graham's newsletter contains regular reviews of ALL new amateur satellite related software. Hardly a month goes by without a new batch of software being reviewed. I would urge all who are interested in amateur radio satellites, or who are developing an interest in this field of amateur radio, to join AMSAT-VK as I believe that the software service alone just has to be worth the membership donation.

ARSENE Report

The news keeps rolling in but it's not all good. It seems that all attempts so far to recover the 2 metre down-link system have been unsuccessful. Meanwhile, many reports are coming in regarding the "S" mode transponder. It seems that to have any hope of working it you will need a pretty good setup. The strength of the down-link signal has been compared to that of sun-noise. EME folk, those doyens of the amateur radio service, tweak up their systems on sun noise.

I believe it's necessary to have your system capable of receiving 10 dB or so of sun noise before you can get all excited about EME. A lot of people are very disappointed about the potential of ARSENE but the problems could be a blessing in disguise. We seem to be generally heading in a "bigger is better" direction in amateur radio satellites with the ultimate goal being to sit back in an arm chair and work the birds on a hand-held transceiver. I think I'll go back to astronomy if that happens!

It may well come to pass that a satellite like ARSENE will put some of the technical "fire" back into working the birds. If more amateurs take up the challenge of working ARSENE and succeed, we may well see them go on to try their luck at EME with their newfound state-of-the-art stations. Maybe the EME folk will find themselves well placed to exploit this new bird with its wonderful high altitude, equatorial orbit. There's not all that much EME activity on 13 cm due to the difficulty of generating high power RF at 2.4 GHz but "S" mode involves receive only and a 13 cm feed would be a simple addition to any EME dish.

ZRO Test Record Broken

I have mentioned the ZRO tests in this column before. They constitute a contest of the best possible kind. A contest where "hog-calling" will get you no points at all and the only thing you are trying to beat is your own previous best effort. A contest where the stations with the very best RECEIVING apparatus get the results.

In brief, a signal is transmitted through a satellite transponder and is adjusted to be the same strength as the down-link

DRAKE

R8 World band radio
100kHz — 30 MHz multimode
Sync detector, twin VFO
Five filter bandwidths
Optional speaker and
VHF converter

JPS COMMUNICATIONS INC.

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NIR — 10 noise/interference reduction unit
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Unit 10, 29 Peel Street
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beacon. It is then attenuated 3 dB at a time during which time Morse code groups are transmitted. The idea being to see how good your receiving setup is by copying as far down into the noise as you can. Now the signal is not all that strong to begin with and 30 dB is a long way down but it has been announced that the -30 dB level, the magic level "A", has been successfully copied by Darrel AA7FV using digital signal processing techniques.

It's interesting to note that his RF equipment wasn't anything out of the ordinary but the DSP involved used up several hours of computing time on a 386 PC! It is generally agreed that an average satellite station will be able to copy about ZRO level 5, receiving by ear. The signals usually disappear below the transponder noise floor at about ZRO level 7 or 8 and from there on only digital processing of some kind will retrieve the signal content.

Many stations are in this league, a few with endorsements down to ZRO level 9. This, however, is the first time anyone has gained endorsement at -30 dB ie level 10 or "ZRO-A". And someone said it's all been done! Where to next?, I wonder.

MIR Crew Change

Maggie VK3CFI reports that the new MIR crew, Vasily Tsiblyev R3MIR and Aleksandr Serebrov R4MIR have been "on-air" and we can expect the same high level of amateur radio activity from them as from the previous crews. They will be changing back to the original frequency of 145.550 MHz and will no longer be using 145.850 MHz due to interference caused to AMSAT operations on that frequency.

Maggie says that Serebrov is the 5th Aleksandr that we have all had the opportunity of speaking to on MIR as well as 2 Sergejs and 2 Anatolys. (And of course, who could forget Musa?). At the time of writing there are 5 people on MIR and Alex R2MIR reported the situation as "joyful".

*359 Williamstown Rd Yarraville VIC 3013
Packet: VK3JT@VK3BBS
ar

AWARDS

John Kelleher VK3DP Federal Awards Manager

Switzerland (HB) — The Helvetia Award

This award is issued by the USKA (Union of Swiss Short Wave Amateurs) for working and confirming contacts with **ALL 26 CANTONS** since 1st January 1979. The award is issued in four categories — mixed phone and CW, CW only, RTTY, and SSTV. Cross-mode and cross-band contacts are not valid.

The cantons, preceded by their abbreviations, are as follows:

AG — Aargau
AI — Appenzell (Inner Rhoden)
AR — Appenzell (Outer Rhoden)
BE — Berne
BL — Basle (country)
BS — Basle (city)
FR — Fribourg
GE — Geneva
GL — Glaris
GR — Grisone
JU — Jura
LU — Lucerne
NE — Neuchatel
NW — Nidwalden
OW — Obwalden
SG — St. Gall
SH — Schaffhausen
SO — Solothurn
SZ — Schwyz
TG — Thurgau
TI — Ticino
UR — Uri
VD — Vaud
VS — Valais
ZG — Zug
ZH — Zurich

QSLs should indicate the canton, and they should be sent, along with a list of the QSLs (complete with QSO data) to **Kurt Binschedler HB9MX, Strahleggweg 28, 8400 — Winterthur, Switzerland.**

The award is free but sufficient IRCs should be included to cover the cost of return postage of QSLs.

WIA DXCC Listings

The listings below are current as at 1st July 1993.

WIA DXCC STANDINGS
PHONE
Honour Roll

CALLSIGN	COUNTRIES
VK6HD	328/342
VK6LK	327/349
VK3QI	326/335
VK3DYL	326/329
VK5MS	323/373
VK4KS	323/365
VK4LC	323/365
VK5WO	323/354
VK3AKK	323/331
VK6RU	322/373
VK5XN	322/338
VK4RF	322/337
VK5EE	321/322
VK2FGI	319/320
VK3OT	318/327
VK4OH	318/320
VK6NE	316/328
VK3CSR	316/320
VK3YJ	316/318
VK1ZL	316/317
VK3AMK	314/329
VK6AJW	314/317

General Listing

VK4VC	308/324
VK5WV	305/322
VK3RF	305/311
VK3AWY	305/310
VK3WJ	305/308
VK7BC	303/309
VK2WU	294/296
VK4UA	293/308
VK4PX	292/312
VK6PY	292/295
VK2AKP	291/294
VK4UC	290/306
VK2DTH	288/289
VK2APK	287/313
VK6RO	287/289
VK6VS	287/288
VK4BG	286/299
VK7AE	285/291
VK3CYL	284/290
VK3DU	284/290
VK4DP	283/292
VK5OU	283/286
VK3VU	272/275
VK3JI	266/279
ZS6IR	261/262
VK3GI	260/262
VK3VQ	257/272
VK2SG	254/274
VK2AVZ	253/257
VK4QO	253/255
VK2ETM	240/
VK2PU	239/240
VK6YF	239/240
PS7AB	236/237
VK3DP	232/233
VK2BCH	224/226
VK2CKW	224/225
VK4OX	220/222
VK5BO	220/222
VK5IE	220/221
VK4OD	216/219
VK1PS	211/212
VK2VBL	208/209
VK4XJ	205/216
VK3DD	202/204
ON6DP	202/
VK4KRP	200/201
VK2VFT	199/201
VK6BQN	187/190
KA1TFU	177/178
VK2BQS	162/163
VK3DVT	160/161
7J1AAL	150/
VK3DNC	142/
VK6LC	140/
VK4VJ	136/137
VK4DMP	128/
SM6PRX	125/126
VK3CIM	123/125
VK7YP	123/124
VK7WD	116/
VK3BRZ	115/116
VK2SPS	114/115
VK4ICU	112/114

VK4NJQ	111/115
VK4ARB	111/
VK4LV	108/110
VK5GZ	108/109
VK5AGM	106/107
VK4EJ	105/106
N4JED	105/
VK4BAY	105/
VK3EHP	104/105
VK4VIS	104/105
VK4BJE	103/104
VK3YH	103/
VK5ZH	101/104
VK2CMV	101/102
VK4KGE	100/101

WIA DXCC STANDINGS
CW
Honour Roll

CALLSIGN	COUNTRIES
VK6HD	323/341
VK3QI	323/330

General Listing

VK2QL	313/359
VK3XB	313/343
VK3YL	304/340
VK4RF	304/328
VK3KS	299/322
VK6RU	275/317
VK2APK	275/304
VK5WO	267/268
VK3AKK	263/265
VK3JI	242/265
VK3DP	215/217
VK7BC	212/219
VK4DA	208/209
VK2CWS	204/205
VK4DP	195/205
VK4LV	184/190
VK6PY	179/181
VK4UC	170/178
VK3CIM	161/
VK5BO	160/184
VK4XJ	151/163
VK5GZ	151/152
VK3DNC	147/148
VK4UA	143/177
EA6AAK	138/
VK7DQ	138/
VK2SG	137/148
VK6ASO	132/133
VK4KS	127/139
VK2TB	124/125
VK3AGW	120/
VK2AKP	116/117
VK5QJ	108/109
VK4FB	105/106
VK4PX	104/112
VK5AKH	100/101
VK6BHW	100/101
DK9EA	100/

WIA DXCC STANDINGS
OPEN
Honour Roll

CALLSIGN	COUNTRIES
VK6HD	328/349
VK3QI	326/336
VK4KS	323/365
VK5WO	323/354
VK3AKK	323/331
VK6RU	322/373
VK4RF	322/354
VK5QW	322/324
VK3YL	321/363
VK3OT	321/330
VK3JA	318/363
VK3AMK	314/329

General Listing

VK7BC	313/318
WA3HUP	308/330
VK3XB	303/340
VK4PX	299/323
VK4UA	296/310
VK2APK	294/328
VK4BG	293/309
VK6PY	293/298
VK4UC	292/310
VK2AKP	291/294
VK2SG	290/314
VK4DP	288/299
VK3DP	288/290
VK6RO	288/290
VK3JI	287/311
VK3CYL	284/290
VK4OD	276/279
VK3VQ	272/287
VK5BO	266/301
VK4ICU	253/
VK4XJ	234/249
VK4DA	209/210
VK3CIM	207/209
VK2VFT	203/205
VK3DNC	181/182
PR7CPK	175/
VK2BQS	172/173
VK5GZ	164/165
VK6NV	155/156
VK6LC	142/143
VK6ASO	137/138
VK4NJQ	134/139
VK2CXC	129/130
VK4ICU	125/127
VK4EZ	123/131
VK2AMV	120/126
VK5BWW	111/
VK4CHB	109/109
VE7RD	107/
VK3COR	103/104
VK7TS	102/
SM7WF	101/
VK7DS	100/102
VK2KE	100/
VK5ZN	100/

WIA DXCC STANDINGS
RTTY
Honour Roll

CALLSIGN	COUNTRIES
VK3EBP	169/170
VK2SG	159/160
VK2BQS	109/110
VK5RY	101/102

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Contests

*Peter Nesbit VK3APN — Federal Contest Coordinator**

Contest Calendar Aug-Oct 93

Aug 1	Jack Files Memorial (CW)	(Jun 93)
Aug 1	VK6 Annual 80 m Contest (CW)	(Jul 93)
Aug 7/8	YO DX Contest (Mixed)	(Jul 93)
Aug 14/15	Remembrance Day Contest	(Jul 93)
Aug 14/15	Worked All Europe (CW)	(Jul 93)
Aug 14/15	SARTG RTTY Contest	
Aug 14/15	SEANET DX Contest (SSB)	
Sep 4/5	All Asia DX Contest (SSB)	(Jul 93)
Sep 5	Bulgarian DX Contest	
Sep 11/12	Worked All Europe (SSB)	(Jul 93)
Sep 18/19	SAC DX (CW)	
Sep 25/26	SAC DX (Phone)	
Sep 25/26	CQ WW RTTY DX Contest	
Oct 2/3	VK/ZL/Oceania Contest (SSB)	
Oct 3	RSGB 21/28 MHz Contest (SSB)	
Oct 9/10	VK/ZL/Oceania Contest (CW)	
Oct 9/10	Iberoamericano Contest (SSB)	
Oct 13/14	YLRL Anniversary Party (CW)	
Oct 16/17	Worked All Germany Contest	(Mixed)
Oct 17	RSGB 21/28 MHz Contest (CW)	
Oct 23/24	CQ WW DX Contest (Phone)	
Oct 27/28	YLRL Anniversary Party (SSB)	

Digital buffs are well catered for at the moment with this month's SARTG RTTY Contest, followed by next month's CQ WW RTTY Contest, which is also open to AMTOR, packet, etc. More observant readers will also have noted the addition of a *Digital* section to our own long-running and very popular Remembrance Day Contest.

The digital section has been added to the "RD" as a trial, to test the amount of interest it generates. As such it provides an opportunity for the growing number of amateurs who have multimode controllers to test their equipment and digital operating skills, without the hassle of entering a big DX contest. If you own such a controller, why not try it out in the RD? Your participation will help your division, and you might even have a lot of fun as well!

In last month's column I expressed puzzlement over an obscure rule for the WAE DX Contest, viz "the minimum time of operation on a band is 15 minutes, although a quick band change to work a new multiplier is allowed". I am happy to say that this means a band change to work another station is allowed before the 15 minute period expires, *if* the station worked on the new band is a new multiplier. Apart from this, the 15 minute restriction still applies. (For this and many other contests which have a similar rule, the point is obviously to prevent amateurs with multi-TX stations having an unfair advantage over the rest of us with only one TX. In these days of quick-tune rigs, I think such rules are becoming increasingly anachronistic. However, I don't make the rules!)

Thanks to VK2PS for contest information. To everyone, please keep the letters coming, especially any spare copies of rules or results. Until next month, good contesting!

Contest Details

The following contest details should be read in conjunction with the "General Rules & Definitions" published in April AR.

SARTG RTTY Contest

Sat Aug 14, 0000-0800 z & 1600-2400 z; Sun Aug 15, 0800-1600 z.

This contest is sponsored by the Scandinavian Amateur Radio Teleprinter Group for 80-10 m. Classes are single operator, single and multiband; multi-operator single TX; SWL. Exchange RST and QSO number. Claim 5 points for QSOs with own country, 10 points for other countries on the same WAC continent, and 15 points for other WAC continents. Multiplier is total DXCC countries plus each call area in USA, VE/VO, and VK. Final score equals total QSO points (all points) times total multiplier (all bands). Use a separate log and summary sheet for each band. Send logs to be received by 8 Oct to: SARTG Contest Manager, Bo Ohlsson SM4CMG, Skulsta 1258, S-71041 Fellingsbro, Sweden.

SEANET DX Contest (SSB)

August 14/15, 0000 z Sat — 2400 z Sun.

This annual event is sponsored by the Radio Society of Thailand. The objective is to promote contacts between amateurs worldwide and stations in the "SEANET" area on 160-10 m (this area includes Southeast Asia, neighbouring oceanic countries, VK, and ZL). Categories are single operator, single and all bands; and multi-operator single transmitter all bands. Call "CQ SEA" or "CQ SEATEST", and exchange RS(T) plus serial number starting at 001 on each band. Multipliers are SEANET country prefixes: A4, A5, A6, A7, A9, AP, BV, BY/BZ, DU/DV/DX, EP, HL, HS, JA, JD1, JY, KH2, P2, S7, VK1-9, VQ9, VS6, VU, V8, XU, XV, XW, XX, YB/YC/YE, ZK, ZL/ZM1-4, ZL6/ZM6, ZM7, ZM8, ZM9, 3B6/3B7, 3B8, 3B9, 4S, 4X/4Z, 8Q, 9K, 9M2, 9M6/9M8, 9N1, 9V.

Stations in the SEANET area should score 10 points for each QSO on 160 m, 5 points on 80/40 m, and 2 points on 20/15/10 m. Exception: claim double points for QSOs with DU/DV/DX, HS, YB/YC/YE, 9M2/6/8, 9V, V8. Contacts with stations in one's own country are not permitted for contest credit. The multiplier equals the number of SEANET countries (as defined above) times 2, plus the number of non-SEANET countries (ie DXCC) times 3. The final score equals the total points times the total multiplier.

No update for this year's contest has been received, so it is suggested you send your log to: SEANET 93, Eshee Razak 9M2FK, Box 13, 10700 Penang, Malaysia. Include 3 IRCs for results. Logs must be received by 31 Oct.

Bulgarian DX CW Contest

Sep 5, 0000 z — 2400 z Sun.

This contest is organised by the Bulgarian Federation of Radio Amateurs, and runs on the first Sunday of September each year on 80-10 m. Classes are: single operator, single and all band; multi-operator single transmitter all band; SWL. Exchange RST plus ITU zone (P2 = 51, VK4/8 = 55, VK6 = 58, VK1/2/3/5/7 = 59). Multiplier equals the total ITU zones worked on each band. Score 6 points for each QSO with an LZ, 3 points for each QSO outside your WAC continent with a non-LZ, and 1 point for each QSO within your WAC continent. SWLs score 3 points if both exchange numbers are copied, and 1 point if only one exchange number is copied. The final score equals the total QSO points (all bands) times the total multiplier (all bands). Send logs postmarked by Oct 5 to: Central Radio Club, Box 830, 1000 Sofia, Bulgaria.

35th Scandinavian Activity Contest

September 18/19 (CW), September 25/26 (Phone); 1500 z Sat — 1800 z Sun.

The CW section of this contest runs on the 3rd full weekend of September each year, and phone 1 week later. The aim is to promote contacts between Scandinavian and non-Scandinavian amateurs on 80-10 m (no WARC bands). Scandinavian prefixes are: LA/LB/LG/LJ (Norway); JW; JX; OF/OG/OH/OI (Finland); OH0 (Aland Isl); OH0M/OJ0 (Market Reef); OX; OY; OZ; SI/SJ/SK/SL/SM/7S/8S (Sweden); TF.

Categories (all band only) are: single operator; single operator QRP (max 10 W I/P); multi-operator single transmitter; SWL. The use of DX spotting assistance from other than the station operator/s is not allowed.

Exchange RS(T) plus serial starting at 001. QSOs after 999 are numbered 1000, 1001 etc. For each QSO, non-European stations should score 1 point on 20, 15 and 10 m, and 3 points on 40 and 80m. The multiplier is the number of Scandinavian call areas (0-9) worked on each band. Portable stations without a district number count as area 0, eg G3XYZ/LA counts as LA0. OH0 and OH0M/OJ0 are separate call areas. SI3-SK3-SL3-SM3-7S3-8S3 count as 1 multiplier, not 6. The final score is total QSO points (all bands) times total multiplier (all bands).

Use standard format for logs and summary sheets. Show duplicate QSOs with 0 points. Dupe sheets are required for 200+QSOs. Forward separate logs for CW and phone sections. Logs on DOS disk in lieu of paper are welcome. Summary sheet must be on paper. Disk logs must be in ASCII, 1 QSO per row. CW and phone logs can share the same disk. Disks must be labelled with call, name and date of contest, CW/Phone, and category. Include an SASE if you want your disk returned. Send logs postmarked by 31 Oct to: Liv Johansen LA4YW, NRRL HF Contest Manager, Box 142, N-7078 Saupstad, Norway. Comprehensive awards to top scoring stations.

CQ WW RTTY DX Contest

Sep 25/26, 0000 z Sat — 2400 z Sun.

This contest is jointly sponsored by CQ Magazine and the RTTY Journal. The object is to contact as many stations worldwide as possible, using Baudot, ASCII, AMTOR (FEC & ARQ), or Packet, on 80-10 m (No unattended operation or operation through gateways or digipeaters).

Categories are: Single operator unassisted, single and multiband; Single operator assisted, all band; Multi-operator single TX, all band ("10 minute" rule applies to this category EXCEPT that one — and only one — other band may be used during the 10 minute period, if — and only if — the station worked is a new multiplier); Multi-operator multi TX, all band.

For single operator stations can operate 30 hours max. Rest periods must be at least 3 hours each, and the on and off periods must be clearly marked in the log. If single operator stations operate more than 30 hours, only the first 30 hours will count towards the official score. Multi-operator stations may operate for the full 48 hours.

Stations may be contacted only once per band, regardless of the mode used. Send RST plus CQ zone; W/VE will send RST, state or area, and CQ zone. Count 1 point for each QSO with stations in your own country, 2 points for each QSO outside your country but inside the same WAC continent, and 3 points for each QSO with stations outside your continent. On each band, the multiplier equals the sum of US states (max 48) and Canadian areas (max 13) *PLUS* DXCC countries (including W and VE) *PLUS* CQ zones (max 40). Note: KL7 and KH6 are claimable as country multipliers only, not state multipliers. Canadian areas are VO1, VO2, VE1 (NB), VE1 (NS), VE1 (PEI), VE2, VE3, VE4, VE5, VE6, VE7, VE8, VY. The final score equals total QSO points times total multiplier from all bands.

Submit a single summary sheet including scoring calculations for all bands, plus for each band a separate log, duplicate check list, and multiplier check sheet. Send logs postmarked by 1st December to: Roy Gould KT1N, CQ WW RTTY Contest Director, Box DX, Stow, MA 01775, USA. (To forestall calls from worried entrants, Box "DX" is not a misprint!) A comprehensive range of plaques and certificates is offered.

Results of 1992 CQ WPX Contest

In order: Call, Band, Final Score, QSOs, Prefixes. *= Low power, #= QRPp. Certificate winners are in bold.

Single Operator SSB:

VK3TZ	A	2,234,804	1356	572
VK5GN	"	1,382,745	1001	455
VK3HZ	"	223,776	345	224
VK2ARJ	28	1,444,285	1137	437
VK5PMC	"	136,170	267	170
VK3SM	14	103,964	200	188
VK3DZM	3.5	33,024	86	64
*VK2AYK	A	481,824	493	336
*VK7ST	"	102,375	210	175
P20A	28	5,184,625	2585	703

Multi-operator Single Transmitter SSB:

VK1DX	6,097,014	2853	747
P29CG	5,099,601	2556	687
VK6ANC	3,510,912	1848	656
VK4WIE	3,088,176	1720	624

Single Operator CW:

AX8AV	A	1,325,524	1041	386
VK4TT	14	3,990	38	35
*VK6HG	A	81,770	166	130
*VK4XA	28	30,480	127	80
#VK5AGX	A	42,180	117	95

For Oceania, VK3DZM topped the 80 m SSB section, AX8AV topped the all band CW section, and VK4TT topped the 20 m CW section. On 28 MHz CW, VK4XA had 4th best score worldwide.

73

Peter VK3APN

"Plug it in to the 240 volt mains socket and switch on. The sharp end gets hot. Hold it by the cold end. Look at the solder. It is like soft grey wire, and when you touch it with the hot end it melts. Now comes the tricky part . . .".
— VK3AUC.

1993 JOHN MOYLE FIELD DAY CONTEST RESULTS

Call	Name/Club	Hrs	Cat	Ops	Band	Mode	Pts
VK6BBY	South West Amateur Radio Group	6	HOME	MULTI	HF	PHONE	108
VK4BHL	Jonathon Bourner	6	HOME	SNGLE	OPEN	PHONE	67
VK4BTS	Mike Howard	6	HOME	SNGLE	HF	OPEN	103
VK6WOG	Peter Ferguson	6	HOME	SNGLE	HF	PHONE	163
VK1KLB	Lawrie Brown	6	HOME	SNGLE	HF	PHONE	42
VK4WIN	Brisbane North Radio Club	6	PORT	MULTI	OPEN	OPEN	276*
VK3ER	EMDRC	6	PORT	MULTI	OPEN	OPEN	136
VK5BAR	Adelaide Hills A R S	6	PORT	MULTI	OPEN	PHONE	410*
VK2HZ	Blue Mountains A R C	6	PORT	MULTI	HF	OPEN	284*
VK4WIZ	The Radio Amateurs Group	6	PORT	MULTI	HF	PHONE	484*
VK4WIW	Cunningham Radio Club	6	PORT	MULTI	HF	PHONE	310
VK6YG	Geraldton Amateur Radio Group	6	PORT	MULTI	HF	PHONE	154
VK4OE/2	Doug Friend	6	PORT	SNGLE	OPEN	OPEN	1114*
VK4BLE	Laurie Pritchard	6	PORT	SNGLE	OPEN	OPEN	392
VK5AGZ	Derek Reuther	6	PORT	SNGLE	OPEN	PHONE	376*
VK3ZA	John McL Bennett	6	PORT	SNGLE	HF	PHONE	78*
VK2ANK	Neil Kefford	6	PORT	SNGLE	VHF/UHF	PHONE	478*
VK2XCI	Norm McMillan	6	PORT	SNGLE	VHF/UHF	PHONE	220
VK5BMT	Maria McLeod	24	HOME	SNGLE	OPEN	PHONE	91
VK3XB	Ivor Stafford	24	HOME	SNGLE	HF	CW	27
VK3KS	Mavis Stafford	24	HOME	SNGLE	HF	CW	12
VK6XG	Andy Russell	24	HOME	SNGLE	HF	PHONE	392
VK4BJJ	Julie Brumley	24	HOME	SNGLE	HF	PHONE	147
VK2UC	Alf Webb	24	HOME	SNGLE	HF	PHONE	41
VK1DO	Christopher Davis	24	HOME	SNGLE	VHF/UHF	PHONE	50
VK6ANC	Northern Corridor Radio Group	24	PORT	MULTI	OPEN	OPEN	5268*
VK4WIS	Sunshine Amateur Radio Club	24	PORT	MULTI	OPEN	OPEN	2612
VK5ARC	South Coast Amateur Radio Club	24	PORT	MULTI	OPEN	OPEN	1798
VK4CHB	Hervey Bay Amateur Radio Club	24	PORT	MULTI	OPEN	OPEN	1242
VK1CEE	J Hendrickson & P Westerhof	24	PORT	MULTI	OPEN	OPEN	178
VK4IZ	Redcliffe Radio Club	24	PORT	MULTI	OPEN	PHONE	4124*
VK3APC	Moorabbin & District Radio Club	24	PORT	MULTI	OPEN	PHONE	1428
VK2FBK	Jeff Brill	24	PORT	MULTI	OPEN	PHONE	1358
VK3GH	Healesville Amateur Radio Group	24	PORT	MULTI	OPEN	PHONE	494
VK5GRC	North East Radio Club	24	PORT	MULTI	OPEN	PHONE	444
VK4DGS	Sergio Gianoli	24	PORT	MULTI	OPEN	PHONE	368
VK4AKH	Granite Belt Radio Group	24	PORT	MULTI	HF	OPEN	828*
VK2WO	Rob Freedman	24	PORT	MULTI	HF	OPEN	534
VK4WIT	Townsville Amateur Radio Club	24	PORT	MULTI	HF	OPEN	286
VK6PM	DP Murphy	24	PORT	MULTI	HF	OPEN	244
VK8DA	Darwin Amateur Radio Club	24	PORT	MULTI	HF	PHONE	388*
VK4WIE	City of Brisbane Radio Society	24	PORT	MULTI	VHF/UHF	PHONE	5526*
VK6KZ	Walter J Howse	24	PORT	SNGLE	OPEN	OPEN	3024*
VK5NW	Grant McEwing	24	PORT	SNGLE	OPEN	OPEN	1040
VK4MWK	Bernard Terry	24	PORT	SNGLE	OPEN	PHONE	1088*
VK4OR	Bruce Bussenschutt	24	PORT	SNGLE	HF	OPEN	600*
VK5JAA	David Giles	24	PORT	SNGLE	HF	PHONE	240*
VK4EV	Ron Everingham	24	PORT	SNGLE	HF	PHONE	106
VK5BW	Alan Raftery	24	PORT	SNGLE	VHF/UHF	PHONE	1472*

Portable entries marked with an asterisk will receive a certificate. As the aim is to encourage portable operation, home stations do not qualify for awards. The President's trophy will not be awarded due to the lack of single operator CW activity.

Unfortunately, I was unable to take part in the contest as I was holidaying in ZL and only took a handheld (only 3 contacts in 2 weeks!!!) No regrets though. We had a ball in the "land of the long white cloud", and the SW region of the south island is something to behold.

Numbers were similar to last year, but on Sunday things slowed down when the 6 hour operators disappeared. What about dropping the 6 hour section? Please get back to me on this. It may be appropriate since there are some sprints around to cater for those who cannot find the full 24 hours.

Comments from logs: It was the first time I entered and I thoroughly enjoyed it. Whilst being in a small tent on a hill with plenty of wind about, calling "CQ CONTEST" for 24 hours isn't everybody's idea of fun, the thrill of working USA and NZ for the first time and also having 10 m open for a change mad

(sic) it all worthwhile (David VK5JAA). (''Mad'' aren't we all! 1PJ).

To win is (etc) but just competing and sharing the friendly rivalry is as much a part of the game as being in the winners circle (Jim VK4BX/VK4CHB) (The more the merrier Jim, and you had a club BBQ to boot! 1PJ).

(Bernard VK4MWK took lots of gear but the last three items took my eye: ''Heaps of coax, heaps of rope, and heaps of sweat''. Thanks Bernard, hope you didn't get into ''heaps'' of trouble from the minister for war and finance at home. 1PJ).

My petrol motor split the pin holding the flywheel in place, and it died shortly after. Had to work all Sunday off the battery (Bruce VK4OR) (Good lesson. How many of you had battery backup in case the gene failed? Bruce also asked if it is possible when contacting DX stations that the serial number from the DX station could be a name instead of a serial number. That sounds like a good idea as it still entails an exchange of information. 1PJ).

I took part to be able to exchange reports and numbers with stations who went to the trouble of setting up their gear in portable locations, and enjoyed the event (Maria VK5BMT) (Thanks Maria, 1PJ).

It's definitely ''field day'' country out here. The population of Mt Hope is 9! The closest ham is Noel, VK2ENA 112 km ENE. Just walking to the pub is an excursion! The local club, Albert Amateur Radio Group, with a membership of about 10, is spread over 2,000 square km. (Norm VK2XCI) (Boy are you in the bush! Can anyone find Mt Hope? You wouldn't want to get too thirsty! 1PJ).

I had a very difficult time erecting antennas in 40 knot winds with sleet straight off the Southern Ocean. After 4 hours and the partial destruction of each beam antenna I was operational (Alan VK5BW) (Was that where you got the ''folded'' dipoles from? 1PJ).

Well, there were more but I had better close. Congratulations to all, and I hope to see you on air. It looks as if the rules will need little change for next year.

Philip VK1PJ
John Moyle Contest Manager

Remember to leave a three second break between overs when using a repeater.

Divisional Notes

Forward Bias — News from the ACT Division

Chris Davis VK1DO

Our news broadcasting timetable appears to have been well received with promising indications on both the Monday night call-backs as well as the Wednesday evening rebroadcast. These rebroadcasts are being handled by a rotating roster of volunteers who take on the job for three or four weeks. There is no great skill involved in undertaking this responsibility with all the equipment being handed over requiring only an antenna to be connected. The time-out pauses are automatically handled by the tape deck and decoding transmitter controller. So if you think you could take on the job for a month please put up your hand.

Our July meeting included aspects of our current broadcast set up as well as some tips on engineering your own station for operation from just one microphone. An operational demonstration of the system being used for repeat broadcasts was shown to members proving just how straightforward the whole task now is.

The August general meeting will be addressed by our District Radio Inspector Gilbert Hughes on the subject " The new Spectrum Management Authority and what it means to you". I hope that students, novices, old hands and anyone interested will take advantage of an excellent opportunity to clarify much of the confusion and misinformation that currently abounds.

The September meeting will conclude a presentation by Ian Cowan VK1BG on radio communications and civil aviation. I am certain that this topic will be of enormous interest to all of us who have had only rare glimpses of what facilities the CAA maintains and uses.

The ACT Packet Group is again hosting the technical symposium to be held this year on Saturday October 30th at the Southern Cross Primary School which is in the suburb of Scullin. Suggestions for topics to be included or offers of presentations or demonstrations can be made to Gavin Berger VK1EB or Neil Pickford VK1KNP. Contact telephone numbers are Gavin on 06 258 539 and Neil on 06 258 7803 and 06 274 8422. The usual BBQ lunch and action packed education day are promised.

Please remember to participate in the Remembrance Day Contest, known affectionately as the friendly contest. Remember to submit a log showing at least ten contacts. Bring your log and summary sheet to the August meeting and we will submit them for you. I look forward to working you all during the friendly contest. So dust off that 52.525 radio, get some antennas ready for that challenging non-repeater operation and I look forward to giving my ''number'' to you.

VK2 Notes

Tim Mills VK2ZTM

Lightning Strike to Dural

At 4.52 AM on Sunday 23rd May, during a good storm over the Sydney region, one strike took a liking to the 11 kV street mains which reflected into the low voltage side of the system. It was items like the beacons, repeaters and packet which felt the effect, in most cases the mains fuses in the power supplies. These were soon restored at broadcast time and then the remaining faults showed up. Some of the ICs in the console switching, the control functions of the 6 and 2 metre SSB, and a driver in the 70 cm repeater, the power supply of the 10 metre beacon and a packet TNC and control card seemed the worse for wear.

Packet was soon restored thanks to the loan of equipment from members. A new RF lineup was grafted into the 70 cm repeater giving it a 15 watt output in place of its previous 8 watts. It was also an opportunity to tidy up the 10 metre beacon which had just been strung together more than a decade ago to get this service on air. With a new power supply and housing it was returned to service on July 4th, slightly closer to its assigned frequency of 28.262 MHz 6 and 2 SSB had a few faults to sort out and should be restored to service by now.

A new solid state unit has been placed in service on 52.525 MHz to allow the poor old BS50 base to assume back up duties. Work is being undertaken to increase the power on the 3593 kHz evening SSB service. There were times earlier this year when the signal became lost in the crowded band.

While on the subject of Dural and the broadcasts we are still, at the time these notes were compiled, seeking a Broadcast Co-ordinator. It is a big job for one person so perhaps a team of people could form a group under a Co-ordinator and compile it on a roster basis. In the meantime various councillors are putting the broadcast together but this is eating into time they could be devoting to

Council matters. Please contact the Divisional office if you would like to assist as a team member.

Happenings

A reminder that the Wagga ARC and the Twin Cities Radio and Electronic Club will be hosting the 2nd Riverina Field Day at Wagga over the weekend 14 — 15th August. See the insert in the July issue of AR. This is also the RD contest weekend and VK2 would like as many operators as possible taking part to help the State score. Broadcast this weekend at 5.15 pm Saturday with the news and opening address.

The Division will be holding exams this month, applications close August 12 with the exam on Sunday afternoon August 29th.

The next Trash and Treasure will be held in the Parramatta carpark Sunday afternoon the 26th September..... Further to the broadcasts please note that in order to forward on material to the compiler, FAXs should be sent by noon on Friday to 633 1525 rather than the previous later time of 6 pm. Likewise with material by packet, send early. ..... It is just over 25 years since permission was given by the Department to establish repeaters ..... The Sydney Progressive Amateur Radio Club — SPARC — was formed last year with the aim of acquiring and restoring the old radio installation, the one time monitoring station at Middle Head, Mosman.

Council

In June Bob Lloyd-Jones VK2YEL found he had to retire from active involvement on Council. His place as Secretary/Treasurer has been filled by Roger Harrison VK2ZTB and John Simon VK2XGJ co-opted to fill the vacancy. The distribution of major Council portfolios for this year are as follows:

Publicity:- Roger Harrison VK2ZTB, Julie Kentwell VK2XBR; Parramatta property:- John Robinson VK2XY, John Simon VK2XGJ; Dural property:- Tim Mills VK2ZTM; QSL Bureau:- John Robinson VK2XY; Membership Services:- Roger Henley VK2ZIG; Education:- Terry Ryeland VK2UX; Federal Councillor:- Roger Harrison VK2ZTB; Alternate Federal Councillors:- Terry Ryeland VK2UX, John Robinson VK2XY; NTAC Co-ordinator:- Caesar Miranda VK2TCM.

New Members

Our usual warm welcome is extended to the following who became members of the NSW Division during June.

S.	(Shannon)	Bathis	VK2JSB	Mortdale
B.	(Ben)	Braithwaite	VK2GHY	Thirroul
J.R.	(John)	Cameron	VK2EJC	Captains Flat
A.W.	(Arthur)	Clarke	VK2GOD	Little Bay
P.	(Peter)	Cox	VK2TCI	Port Macquarie
M.F.	(Mark)	Grogan	Assoc	Toukley
F.	(Frank)	Hunt	Assoc	Parramatta
A.	(Allan)	Jackson	VK2DAM	Leeton
R.D.	(Richard)	Kidd	Assoc	Orange
S.	(Shigetoh)	Kumagai	Assoc	Gordon
E.	(Emil)	Lahodny	VK2FHC	Jindabyne
J.	(James)	Morris	VK2GVA	Manly
V.	(Val)	Pinczewski	Assoc	Northbridge
D.R.	(David)	Plumb	VK2DRP	Bega
D.M.		Reed	Assoc	Valley Heights
J.	(John)	Rogers	VK2ACW	Armidale
G.H.	(Geoffrey)	Schuler	Assoc	Baulkham Hills
R.E.	(Raphael)	Shammay	Assoc	Bondi Junction
J.	(John)	Vittorio	VK2MMX	Penshurst

5/8 Wave

Rowland Bruce VK5OU

The June meeting was held on a bitterly cold night, by Adelaide standards at least, the day after the winter solstice. There being five Tuesdays in the month it was a buy and sell night and, as usual, Peter Maddern did an excellent job of not only disposing of some junk (I bought some of it), but also keeping us entertained for an hour or so. There were some absolute bargains to be obtained, too. Where do they all come from? The next buy and sell will be this month, August 24th. See you there?

I was handed a copy of a request which may strike a chord with some readers of this column in other states as well as in South Australia. Neville, who can be contacted by 'phone on 08-274-1103, is researching the history of radio manufacturing in South Australia during the 1920's and 1930's. Anyone working in that industry, and especially in "Gladiola," is asked to ring Neville on the above number.

I see that the ever increasing load on the Equipment Supplies Committee (sales have grown by 550% in the last three years) has caused them to expand their group. They have a new address, PO Box 789, Salisbury, SA 5108. Please do not send mail to the WIA address in Adelaide as this could result in considerable delays. The telephone and fax numbers are identical. I guess this means there is not a dedicated line; or do they have an automatic switch? Whatever, it is 08-287-2868. Talking of things "automatic," the VK5WI Packet on 420.1 MHz now has a 4800 baud port installed.

We have yet another member from the Northern Territory, Alan Baker, VK8ZAB. Welcome to the WIA. It really is good to see the numbers of Territorians joining of late. Could it be a spin off from the SEANET Convention last year?

ar

How's DX

*Stephen Pall VK2PS**

Solar activity remains very low with the solar flux number dropping down on some days to near 80. The 40 — 80 — 160 metre bands performed adequately under the difficult circumstances and quite a number of contacts were made with DX stations. A small group of VK DX-ers on 1832 kHz has so far had 49 successful sessions with North American counterparts across the Pacific. According to G8KG as quoted in the RSGB "Radio Communications" magazine, the Brussels SIDC March 1993 Bulletin made a tentative forecast of the timing of the forthcoming minimum of our present solar cycle (22) as arriving probably between November 1995 and September 1996 which would mean an unusually short cycle lasting between nine and ten years.

It is quite usual to see references to the "11 years cycle", however the past 14 cycles fall into two distinct groups. Seven "long" cycles (9 to 14 and 20) with a mean duration of 11.7 years and seven "short" ones (8, 15 to 19, and 21) with a mean duration of 10.2 years, the shortest of these lasting 9.6 years.

Spratly Islands — 9M0S

Martti Lane — OH2BH — sent a detailed report to various DX publications about this recent activity. Here are a few highlights. Due to last minute changes the expedition flew in on to a 1500 foot air-strip which is located on Swallow Reef (Layang-layang), itself a small islet of 2000 feet by 400 feet.

Due to weight and other restrictions the amplifiers were left behind. At one stage there were two stations on the 20 metre band simultaneously. The six days activity resulted in about 37,000 QSOs of which more than 10,000 were on the WARC bands. The expedition enjoyed the presence and the safety protection of the Malaysian Royal Navy and they are grateful for the assistance given by various Malaysian Government agencies, the Malaysian ARS (9M2), and the Sabah ARC (9M6).

Libya — 5A

The saga continues. It was in June AR when we reported last about Romeo's 3W3RR activities. Romeo did not attend

the Dayton Hamvention but he was reported on the air on the 5th of June as LZ/3W3RR and as LZ/AH0M on the 8th of June. (Romeo's US callsign). On the 11th of June it was said that he hoped to be active "within 3 days". 5A0RR showed up on 20 metres on the 16th of June working with a 100 kHz wide split which angered many users of the band. He was also heard on 20 metres CW with weak signals. Then he disappeared. Rumours are floating around, but none substantiated. It is said that Romeo is "on a business trip " in Libya. Others seem to know that the Libyan authorities have restricted his activities to a small portable or mobile operation. A number of Europeans have worked him on 80 metre CW (and SSB) and 20 metres SSB. The last reported CW activity attributed to him was on the 18th of June. As usual, some of Romeo's operations are controversial. His North Korean activity is still not recognised by the DXCC, and it is alleged that physical proof of his presence in North Korea is still required. Yours truly is still waiting on his QSL cards from the Myanmar (XY0RR Sept 91) and Afghanistan (YA0RR Dec 91) activities.

Dick Smith — VK2DIK — Balloon Crossing

The Transcontinental non-stop balloon attempt was a great success. Dick and his co-pilot John Wallington lifted off from Carnarvon (VK6) on Thursday, 17th of June at 0052 EST (1452 UTC on 16th of June) and after 40 hours and 23 minutes of flying at speeds up to 188 km/h and at heights up to 22000 feet (6707 metres) they landed at the small village of Tabulam (VK2) 40 km west of Casino (lat 28 degrees 25 minutes south and long 152 degrees 55 minutes east) at 1715 EST 18th of June (0715 UTC). The total non-stop distance was 3640 km (1965 nautical miles) thus improving on all seven previous attempts.

The interest and cooperation of all the VK radio amateurs who were following the balloon's progress on 20 and on 40 metres was commendable. There were hundreds of stations listening and keeping the frequencies clear. A number of volunteer relay stations offered their services which were gratefully accepted. Many contacts were made with the Mission Control station VK2AWI. Some individual amateurs even managed to have a few short contacts with Dick himself. Amateur radio in general received a good media coverage. Special event station VI2AUS was on air a few hours after the landing and managed almost 2000 VK and international contacts on various bands and modes in 13 days. The special activity ended at 2359 UTC on the 30th of June. QSLs to VK2WI with a SASE.

Eritrea — E35X

The DXpedition of one Japanese and three Norwegian radio amateurs started at 1830 UTC on 1st June and closed at 0620 UTC on the 9th of June. About 20,000 QSOs were made with about 125 countries on 10, 15 and 20 metres SSB and CW, but there were some contacts on the 40, 80, 160 metre bands and a few RTTY QSOs also. A three day amateur radio seminar was held at the Eritrean Telecom office with about 15 participants, followed by a 4 days seminar at the Asmara Technical School with 35 participants. A number of ARRL manuals, lecture notes and a complete amateur station were left behind for the Asmara Technical School Radio Club which has 27 members. QSLs to Ruth Tollefsen, P0 Box 17, Tveita, N-0617, Oslo. One card per QSO please.

Future DX Activity

- Be prepared for some interesting activity from Christmas Island, VK9X in August. It is possible that one well known DX-er with a special call will operate from there.
- There are now two new operators on Svalbard Island. JW6MY is LA6MY mainly on CW for about 4 months. QSL to his home call. JW6LIA is Ove and QSL goes to LA5NM.
- ON4QM will not go this year to Sao Tome & Principe Islands. Instead he will have a Pacific tour in August.
- There are now a number of operators on short assignments in Somalia. KN4NL/T5 was heard, and Bert SM3HLL is active as T5HLL. QSL to home calls.
- ITU has allocated the Z3A to Z3Z callsign block to Macedonia. Some Macedonian amateurs are already using the new prefix. So far Z31PK (ex-4N5PK), Z31FK (ex-4N5FK), and Z32ET (ex-YU5DRS)have been heard.
- Iran. 9D2CW will be active for about 2 years.The Iranian nationals receive the EP prefixes, foreigners are issued with 9D2 calls.
- Wake Island KH9. A student team from the California Polytechnic State University Amateur Radio Club (W6BHZ) will be active from this island from the 31st of August to the 10th of September. QSL will go to Oklahoma DX Association, P0 Box 88, Wellston OK, 74881, USA.
- Penguin Islands ZSI. A group of German operators are planning to activate these islands from the 25th of July to the 3rd of August.
- The Kyoto Amateur Radio Club will be active with a multi operator DXpedition on Belau, KC6. The nine Japanese operators all have individual KC6 callsigns. QSL to JA3OIN.

Interesting QSOs and QSL Information

- CO2VJ — Juan — 14002 — CW — 0440 — May. QSL to I0WDX, Cesare Casaroli, Piazza Conti 2, I-00010, Poli, Italy.
- C91J — John — 14014 — CW — 0622 — June. QSL to W8GIO, Paul R. West, Rt 1, Box 140-42, Bunker Hill WV, 25413, USA.
- AL7MX — Kevin — 1832 kHz — SSB — 1200 — June. QSL to Kevin G. Forster, P0 Box 877326, Wasilla AK, 99687, USA.
- SV5TS — Vasilis — 14276 — SSB — 0619 — June. QSL to Vasilis Argyris, Demokratias 146, GR-85106, Paradisi, Greece.
- YI1DZ — Diah — 14251 — SSB — 0552 — June. QSL to The Manager, P0 Box 7361, Baghdad, Iraq (Note — send IRCs only).
- VQ9AC — Jim — 7008 — CW — 1229 — June. QSL to WN80, James L. Wilson, NSGA Adak PSC 481, Box 537, PO AP, 96505 USA.

ELECTRONIC DISPOSALS

Electrolytics:	each unit
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220 uf 100 v	.70 ea
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50, 8 10 uf 300 v	2.20 ea
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27 The Mall, South Croydon (Cnr Eastfield/Bayswater Roads) Victoria, 3136. Tel: (03) 723 2699

- ZL4FNP — Brian — 14195 — SSB — 0300 — June. QSL to The Manager, P0 Box 1260, Invercargill, New Zealand.
- 7Q7XX — Kay — 14222 — SSB — 0615 — June. QSL to JH3RRA, Shinya Takenaka, Box 21, Katano, Osaka 576, Japan.
- HH2B — Bernard — 14247 — SSB — 0504 — June. QSL to Bernard Russo, Box 38, Port au Prince, Haiti, Caribbean.
- T95X — Slavo — 14192 — SSB — 0541 — May. QSL to 9A2AA Tomislav Dugeo, Box 255, 58001 Split, Croatian Republic.

From here and there and everywhere

- Joe K8JP QSL Manager for Ed, 3CITR, advises that Ed will be operating from 3C -Equatorial Guinea until September on various nets. You might hear him also on slow CW and RTTY.
- Neil VK6NE the VK9 and VK0 WIA QSL Bureau manager advises that Tony VK9LA of Lord Howe Island has now a credit with the Bureau and cards received by the Bureau will be forwarded to him. Bill VK4CRR also established a credit with Neil, for the receipt of VK9LD cards through the Bureau.
- Steve HB9DX wrote to me that one US Dollar does not cover the cost of postage from most European countries to places outside Europe. In Switzerland the airmail postage for a letter to another continent is Fr 1.80 whilst one gets only Fr 1.40 for one US dollar. Other DX publications mention Germany and Austria where postage costs are high. It seems to me one should not send "green stamps" but one IRC per reply. According to the wording on each IRC, "the coupon is exchangeable for a stamp or stamps which represents the minimum postage for a priority item or an unregistered letter *by air* to a foreign country". The operative word here is *exchange for stamps* and not for money. However it is well known that some QSL managers are exchanging IRCs for money either in their own country or they are selling the IRCs via mail to other amateurs at a discounted rate therefore they are converting IRCs into money. One tends to forget that only post offices are licensed by the Universal Postal Union to sell IRCs. Experience shows that some QSL managers feel that they are entitled for an additional "extra" to cover incidentals such as the cost of printing of QSL cards for the DX station, the cost of airmail envelopes where no envelope is supplied or where only address labels are at hand.

  All this confusion about the cost of direct QSLing by managers and individuals could be cleared up if those who are involved in this direct system of QSLing would declare their policy openly in advance. They should state their "fees" for the service they provide as distinct and as additional to the cost of the postage. The very often quoted F6FNU QSL service policy at least is clear: he charges two green stamps for the return of the QSL card and that fee includes return postage. On the other hand he does send you the card. However some ethical problems still remain to be solved. One hears the argument that amateur radio is not about making money but it is a voluntary hobby. One however should make the distinction between the QSL manager (with an administrative service role and who is an intervening third party to the transaction) and the DXer who handles his own QSLing. Another point of view: there are major, openly sponsored DXpeditions, there are "diplomatic" DXpeditions (to open up a new country for amateur radio), there are freelance DX groups and there is the last one in the line, the lone single DXpeditioner. Among these groups what is the proper, equitable and fair way of QSLing? Of course there is also the problem of QSLing by DXers via the QSL Bureau system. It is a known fact that some DXers or DXpeditions very rarely send a reply card via the Bureau system. It is hoped that the September DXAC meeting when poor QSLing practices of DXers will be discussed will lay down some clear guidelines to which DX-ers who seek accreditation of their activity for DXCC purposes will have to adhere in advance in writing. Then there will be no more misunderstanding.
- N9MDW/P/5N6 has now returned to the USA.
- 7Q7RM Ron says that his QSL manager is G0IAS.
- The DXCC desk advises that the T5/KF6BL activity is now accepted for credit.
- Christy de Kock ZS8MI, Marion Island, is active. He will stay on the island for the next 18 months. He has checked into the ANZA net (0530 UTC 21205 kHz), into the European DX net at 1500 UTC on 14243 and into the Spanish net at 1530 UTC on 21200 kHz. His home call is ZS1CDK (not in the callbook), but he has now acquired a post office box for the expected extensive mail. He requests two green stamps for an ordinary QSL card and 3 green stamps for a special card. His postal address P0 Box 244, Stellenbosch, Cape Province, 7599, Republic of South Africa.
- "Jo" Harris — VK2KAA — 59 Westbrook Ave, Wahroonga, NSW 2076, the VK2 Division's historian, wants any VK2 QSL card for the divisional "History of VK2 Callsigns" collection. She is also looking for a VK2 amateur as a curator for the Division's QSL card collection. If you feel you can assist, please contact her.
- The ITU has a new 1 kW beacon in Norway — an omnidirectional antenna — with the callsign LN2A. It will be a useful tool to check propagation on various bands. Time (UTC) and frequency schedule is as follows: 0020 and 0040: 14405 kHz — 0424 and 0444: 20945 kHz — 0828 and 0848: 5470 kHz — 1232 and 1252: 7870 kHz 1636 and 1656: 10407 kHz.
- Do not expect to receive the AH1A cards before September/October. They are being printed in Belgium.
- After very long negotiations the Canadian Radio Relay League and the Canadian Amateur Radio Federation have finally merged to form the Radio Amateurs of Canada (RAC).
- Alain, ZD9CQ is on Gough Island until November. He is active on 20 and 40 metres on SSB. QSL to ZS6AS.
- Andy, ZD9BV and his wife Lorraine ZD9CO are the only amateurs on Tristan da Cunha. They operate only until midnight local time, when their generator power goes off. You can find them on 21260 kHz (1830 UTC), 21313 (1800 UTC), 21355 (1930 UTC). QSL to W4FRU.
- The DXCC desk advises that the backlog of unprocessed applications at the end of May was 278 with 48,803 QSL cards.
- The DXCC desk has announced that QSL cards from 4N4 and 4O4 stations will be acceptable for DXCC credit for QSOs up to the 11th of May. QSOs from 12 May onwards must be with T9 stations.
- An international group of amateur operators has targeted Pratas Island as a possible new DXCC country or as a new reference number in the IOTA program. The island lies in the South China Sea and has a Taiwanese military base. The callsign is reported to be BV9P.
- Belize, V31BR will be active from the 9th to the 16th of August on the usual DX frequencies and on the Southern

Cross DX net, 14226 kHz at 1100 UTC. QSL to N5FTR.

- LU1ZU is now active from Argentina's Esperanza Antarctic Base (63°24' S and 57° 00 W).
- Ken, WA40BO is in Chad with the callsign TT8OBO. He was heard around 2000 UTC on 14256. QSL to home call.
- The JH1AJT proposed Eritrean DXpedition is now scheduled for the end of July or early August. Incidentally, the DXAC has not yet decided about the DXCC status of Eritrea.
- Mike, VS6WV will be visiting Cambodia on a regular basis and from time to time he will be on the air as XU6WV. QSL goes to K0TLM.
- If you change your address and you want the information to be correct in the "International Callbook" please write direct to: Radio Amateur Callbook, P0 Box 2013, Lakewood, NJ, 08701, USA.
- If you are lucky, you might find Michael, OX/N7PQO on the bands, operating from the Greenland Ice Sheet Project until about the beginning of August. QSL to AA7UT.
- Duane, WV2B and Art WA2UJH were active from St Paul Island as WV2B/CY9 and as WA2UJH/CY9.
- ZK1AJJ/ZK1 was active from North Cook Islands. For months previously he was on Pitcairn Island. QSL for this activity goes to JR2KDN.
- The RSGB International HF Convention will take place at the Beaumont Conference Centre, near London's Heathrow Airport on the 8th to the 10th of October.
- Ron, ZL1AMO was active from Fiji and from Rotuma Island as 3D2RW/R.
- St Peter & St Pauls Rocks. The NATAL DX Group of Brazilia is planning a DXpedition in January/February 1994 to these specks of islands in the Atlantic.

QSLs received

CM2CK (8W op) — KG4HG (2W op) — VU7SF (14W op) — TI4CF (4W TI2CF) 4N4CX (4W WA4WTG) — 3C1TR (6W K8JP),

Note "Murphy's" misprint in "AR" July 1993 issue — Bosnia Herzegovina, new prefixes. "National Soviet" should read "National Society".

Thank you

This column would not have been possible without the input of the following contributors: VK2DID — VK2KAA — VK2KFU — VK4BCP — VK4DA — VK4OH — VK5WO — VK6NE — HB9DX — K8JP — WA4WTG and the following publications: QRZ DX — The DX Bulletin — and the DX News Sheet, Many thanks to you all, ***Good DX and 73.***

PO Box 93, Dural, NSW 2158

Silent Keys

Due to increasing space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

D M (Donald)	CLARK	VK1CD
W (Bill)	DAY	VK2BDQ
O E (Orme)	COOPER	VK2CP
J E (Jim)	OCKENDEN	VK2UZ
M W (Mervyn)	COLLETT	VK2UMC
S G (Stan)	TAYLER	VK3DHN
J A (Joe)	ACKERMAN	VK4AIX
B H (Bruce)	BUSSENSCHUTT	VK4OR
G (George)	BURGESS	VK5CGB
F C	LAMBERT	VK6FL

Orme E Cooper VK2CP

Mr O E Cooper, BEM, VK2CP died 15th June 1993. Orme was in both the amateur and commercial communications fields for 60 years, retiring as Manager of the big OTC International Switching Centre at Paddington, Sydney. He was awarded the British Empire Medal for services to telecommunications.

Orme's knowledge was prodigious; landline and radio telegraphy and telephony, repeatered submarine telephone cables, all phases of amateur work as well. He was both a "hands on" man as well as a competent administrator. At one time AWA had him managing a broadcast station.

I first read of him in the old "Australasian Radio World" magazine about early 1939 when it recorded his having worked 17 US amateurs in one month on 20 metres using 2 1/2 watts of AM phone. As soon as amateur activity resumed after WW2 Orme and his friend the late Dr Leo McMahon VK2AC commenced experimenting with SSB. After overcoming receiver instability due to heat drift in the valve equipment they were credited with being the first VK2 hams to set up a circuit in this mode.

Although dogged by ill health Orme never faltered; he was unstoppable and was active right until the end. Charlie Peter will be sadly missed.

W Easterling VK4BBL

Colin C Paterson VK2BCP

Col passed away on Monday 31.5.93 after a long and trying illness. After serving in the RAAF — three years as a Flying Instructor — he became a Master Plumber and set up his own business.

Upon retirement to Wiseman's Ferry he took up Amateur Radio obtaining his novice call VK2NEU in 1977 and his full call a couple of years later. In addition to many other contacts he operated a net every evening at 1700 hrs EST on 80 m. I first joined the net in January 1979 but did not become a regular until 1982 by which time Col had suffered a stroke. Notwithstanding his handicap he maintained the net with increasing difficulty until the control was taken over by Les VK2LW.

Early in 1992 he and wife Judy moved to a Unit in Nerang, Queensland, in order to be nearer their married children. He acquired a new callsign VK4CCP but unfortunately was never able to use it. Shortly after the move his condition became worse until he "called it a day" at 8.00 pm on 31st May.

He is survived by his loving wife Judy, children Craig and Judith with spouses Robyn and Ashley, and grandchildren Kjell and Heath, to whom the members of Col's Net particularly offer their sincere sympathy.

Franklyn Pain VK2DYP

Clive Cooke VK4CC

After leaving school during the mid nineteen thirties, Clive joined Stromberg Carlson as a Tester. He worked with this Company until the WW2 years when he left to join the RAAF. He served as a W/T Navigator with 30, 7 and 28 Beaufighter Squadrons. After leaving the Air Force at the end of WW2, Clive opened a radio sales and repair business in the suburb of Windsor in Brisbane. Sometime later he disposed of the business and joined the PMG Department, Telegraph Branch as a Telegraphist. From this Branch he was later posted to the Wireless Branch and subsequently became a Radio Inspector.

After appointment to RI the Department employed him in Type Testing of particular categories of electronic equipment. The next move was to the Division of Frequency Allocation. Shortly after this appointment, Clive obtained twelve

months leave of absence to join one of the early post WW2 expeditions to Macquarie Island in the Antarctic, as Radio Communications Officer. At the conclusion of the Expedition, he returned to the Wireless Branch where he remained until retirement during the mid nineteen eighties from the Branch which in the meantime had been restructured to the Department of Communications.

Clive is survived by his wife "Jo" (Mavis), son Peter and two daughters.

Our sympathies to "Jo" and the family in their great loss. The amateur fraternity will also miss this most worthy member.

Theo Marks VK4MU

Joe A Ackerman VK4AIX

Joe became a Silent Key on 4th June 1993. Aged 82 years.

Joe was a keen DX man and kept meticulous records. His awards indicate how he persevered until he gained an award. In retirement Amateur Radio and DX was his life.

Joe was born at East Orange on 12th April 1911, the eldest of seven children. He left school at 14 years of age and became a messenger boy with the Post Office at Dubbo NSW. Later he worked on telephones at Edgecliff NSW.

Joe joined CMF Signals in 1931, was called up on outbreak of WW2 and commissioned as a Signals Officer in 1941. He served in the CMF in Signals for 27 years.

He retired from the GPO at 65 years of age, as Assistant Superintendent of the Sydney Mail Exchange.

Pre-war Joe became a "HAM" and was a member of the Lakemba Radio Club. He became Secretary of the Hurstville Amateur Radio Club.

Post war he was QSL Manager of the Gold Coast ARC, Contest Manager of the VK4 Division of the WIA, and for two years was the Sub-Editor of the "Amateur Radio" magazine.

Joe was a staunch Mason and served as 1st Principal of Liverpool NSW Royal Arch Chapter.

To me, Joe was a great friend. His dry humour was something to hear and experience. Joe and his wonderful wife Heather attended all our family celebrations since I retired in 1982.

To Heather and Joe's family I extend condolences on behalf of Joe's many "HAM" friends.

We miss you Joe, but somewhere there is a place where we old "HAMS" will meet again and have a great old "Rag Chew".

Don Hopper VK4NN

Lt Cdr George Burgess (Ret) VK5CGB

George died on 14th May 1993 at Modbury Hospital, Adelaide a few weeks after having a Cerebral Vascular Accident at home.

George studied Dentistry at Manchester University in the UK, then joined the Royal Navy and was commissioned in 1941. He served on HMS Norfolk, Jacques Morgand, Prodigal, Tirade and Deersound.

He was a founder member of his local Round Table, played Rugby for Keswick, and formed a Sea Cadet Unit. He was also a Special Constable, enjoyed many sports...tennis, badminton, swimming, sailing and climbing. He travelled over much of Europe with his wife Sue before coming to Australia.

Over here he continued in Dentistry and served with the Naval Reserves and Sea Cadets. Latterly he became interested in amateur radio, computing, fishing and french polishing and found time to assist in local community services.

For many of us George will be more than widely remembered as the Secretary for RNARS Australia and Manager for SA. He had CW/DX friends worldwide and controlled the RNARS/VK Monday evening net on SSB.

He will be sadly missed by all who knew him, especially by Sue and family to whom we extend our deepest sympathy.

Derek VK5AFP and members of RNARS/VK5.

ar

Over to You — Member's Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Skeds with Brazil

During the recent visit of many international Rotarians, one in particular from Brazil met with me to discuss amateur radio. He expressed an interest in making contact with Australian amateurs. Details are as follows:-

His club:- Grupo Hermandad Radial Universal "Caballeros del Aire", Ruben S R Arza, PO Box 38, Montevideo, Uruguay.

Personal details:- PY2PRR, P R Romanoschi, Rua Candido Brasil Estrela, 321, CEP.15.054.220, Sao Jose Do Rio Preto SP Brasil.

Club times suggested:- Sat/Sun, 19 hrs GMT 21.275 MHz, 16 hrs GMT 28.775 MHz, 22 hrs GMT 14.275 MHZ.

Gordon Dawe VK3GAD
5 The Close
Frankston VIC 3199

Or a Belgian Penfriend

I have received a letter from a Belgian SWL who wanted information about our Zone 29 award for publishing in CQ/QSO. This is a magazine of the DIG, a German awards club. The letter's author asks could I publish a note in our magazine asking for penfriends for him. So:-

WANTED

Belgian SWL would like VK pen-friends. Interests include chasing awards, radio general, family, international friendships. Egbert Hertsen, Postbus 85, Mechelen 2, B-2800 Mechlen, Belgium.

Neil Penfold VK6NE
2 Moss Court
Kingsley WA 6026

Following Dick's Balloon

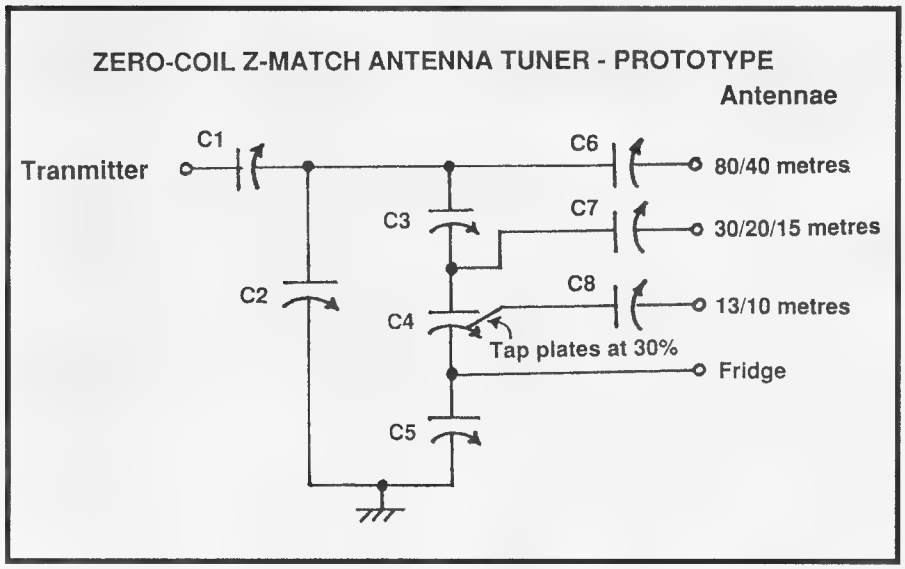
The Dick Smith Flight was a "ONE OFF" and a change for a number of Hams from giving weather reports, signal strengths and types of gear. It was quite AMATEURISH and therein was its interest. The first day we had heights and altitudes, local and GMT time, headings in magnetic and true, and therefore breakers wanting to know which was correct. Second day it was much better. A plus to all, and a word to the WIA. Very few people worked Dick direct. Fair enough if they would like a QSL card. But surely the WIA should make a comment about everybody else who thinks they are entitled to a card by just working or talking to the ground control station. Even the famed Drover's Dog could do that! By the way, did anyone else besides me hear QANTAS 5 call VK2DIK on 20 m or was it only me? A plus for Ham Radio. A "well informed" VK4 said they were flying a Great Circle Track (?) and another said he was on CW (?).

G W Lanyon VK2AGL
16 Hilton Avenue
Roselands NSW 2196

Single-Coil Z-Match Tuner

As a builder of the 2-Coil Z-Match I looked forward to the second part of the article by Lloyd Butler with a particular interest. I had hoped to find the Perspex coil former properly drilled. Shock...Horror — No change!

As you should know one row of holes must be displaced axially with respect to



the other by half of one pitch in order to match the helical form of the coil.

This serious error was plainly evident in the published photographs of the 2-coil Z-Match; the coils were squashed out of shape. The coils in my Z-Match have, of course, correctly drilled holes.

While on the subject I must admit to lamenting the loss of one coil — for aesthetic reasons. However, as always, one must bow to development and progress. I have therefore anticipated your next move by drafting a Prototype Zero-Coil Z-Match.

As you see from the enclosed circuit diagram there are no coils (of course), and no switches; but there are eight (8) variable capacitors each with its own vernier drive. I should warn enterprising experimenters that tapping down the plates of C4 is difficult — I destroyed 15 capacitors doing so.

When study of the Single-Coil Z-Match is completed (in 1996?) I'm sure that the next phase of development will deserve equal in-depth analysis.

Geoff Combes VK4GWC
Lot 2 Kirbys Rd
Palmwoods Qld 4680

More on Kingsley Radio

Having followed with great interest the article in your excellent magazine relating to the late Howard Kingsley Love, I wish to tell you this story, which relates to myself.

Having fooled around with wireless since the early 1920s to the rig after the war being a 100 TH modulated with a pair of 809s Class B, somewhere along the line I met and became associated with Howard Love. Maybe at this time I was little more than a nuisance to him and his gang in the St Kilda Road workshop.

However the result of this association made available to me the Kingsley AR7 receiver serial numbered 2S for Sugar. Howard himself had the first set number 1S and I had number 2S. The serial numbers distinguish them from the sequence of those supplied to the Defence Department.

Whilst in contact with a ZL ham named "Jock" the subject of the AR7 and its similarity to the American National HRO was discussed. Jock explained to me that he was establishing somewhere in the centre of the North Island of New Zealand a Museum of wartime equipment and asked me to put a price on the AR7 Serial No 2S. I had the set crated and sent to Jock free gratis and for nothing for his museum, where it now resides. I later received a letter telling me that the members of his club had re-conditioned and serviced 2S and it is operating excellently.

I do not know what became of 1S more than I know the full handle of Jock or his QTH. Maybe one of our VK lads may raise this subject with the ZL boys and determine the present home of Kingsley AR7 number 2S.

I could, of course write much more but the present article on the AR7 is being covered excellently.

John Taylor VK3AJT
2 Western Beach
Geelong VIC 3220

More Morse Stories

Strange but true, I can personally confirm similar experiences as expressed in Members" Opinions in July "AR" concerning Bob (VK3SK). After joining the Marconi Company at West Ham in 1952 I was ushered to a room to await further developments. When you were selected to crew a ship, your surname was broadcast in Morse via an internal intercom unit, followed by a single letter denoting the room to which you had to report. Nobody missed the ship.

Secondly re Tom (VK5TL). A first AIF gent by the name of Lew Seccombe showed me a method of monitoring distant LF Navaid identifications during periods of QRN and weak signals. He used to place the palm of his hand on the front of the earphone, turn it around and place the rear of the phone on his cheek. It worked, and I used this unorthodox method on many occasions.

D Reynolds VK2ANW
9 Arterial Road
Killara NSW 2071

Piratical Prostitution?

I refer to my letter published in the July issue of AR under the title of "Presumptuous Pirates". Feedback indicates that my claim of the prostitution of amateur radio should be clarified.

I define prostitution as the selling of favours for money.

My claim of the prostitution of amateur radio is justified by this example:

During February an American vessel in Gizo (Solomon Islands) had a number of phone patches through a Northern New South Wales amateur to his wife Joyce in the Cairns Base Hospital and later at the CWA hostel. When these phone patches were being arranged the American station indicated that he would pay for the calls from NSW to Cairns (it being cheaper than Gizo/Cairns). These phone patches ceased when the wife left Cairns and returned to Gizo. On 22/2/93 the Gizo station was advised by his VK4 friend that the cost of his phone patches was $A39.69 and arrangements were made for him to pay by cheque.

Fact: International Radio Regulations limit third party traffic to items of a technical nature or of a personal nature of such unimportance that recourse to the public telecommunications network is not justified.

Question: Does this mean that the station in Gizo and the NSW station consider Joyce's state of health did not warrant recourse to the public communication network?

Or does this mean that one station is paying for favours granted, and the other station selling favours?

Which takes me back to my definition of prostitution.

What do you think?

Deane Laws VK4ALN
27 Awoonga Ave
Burleigh Heads Qld 4220

BT

International Amateur Radio Union Monitoring Service (IARUMS) — Intruder Watch

*Gordon Loveday VK4KAL**

A Few Pointers to Help with FSK and RTTY

FSK Morse This method of sending Morse code often produces confusion to monitoring stations. It is difficult to receive the code when listening to both the carrier and shifted carrier. To read correctly, simply switch in a narrow filter and listen to the shifted carrier only.

RTTY Many intruders on amateur bands use radio teletype. For privacy they seldom use the standard 5 bit Baudot/Murray code format. Computer generated "on-line cypher" machines also make some RTTY codes unbreakable. The patient monitor will sometimes be rewarded when the operator omits to switch in the cypher machine.

Beacons Single letter beacons are becoming a numerous commodity. We have "V, K, U, N, T, A, H, F" and possibly many more not listed as yet by observers. It seems they were first noticed about 1985. Where do they originate? Some, we know, come from "old Russia", now CIS. These signals, although mainly weak, are easily identified by a single letter sent in FS Morse telegraphy, usually using 1000 Hz shift. Two families of beacons spread between 2 and 30 MHz transmit these unusual signals.

Extensive listening by a number of investigators has suggested the "K" beacon is located near Petropavlosk on the Kamchatka Peninsula on the Pacific coast of Siberia. The "U" beacon is thought to be in the general area of Murmansk-Amderma on the north coast of the Arctic. It is surmised that these beacons are used for marine service by the Soviet fleets, but the ultimate purpose of the signals is open to question. Further monitoring of the subtle frequency shifts and data bursts of these beacons is required.

High frequency single letter beacons are not random transmissions scattered haphazardly across the spectrum. They inhabit specific bands and transmit in a highly structured manner. There are three families of beacons, "K", "U", and the "Cluster" beacons (more about these at a later date). The "K" and "U" beacons are FSK, and the "Cluster" are on/off (CW) keyed. The "Cluster" beacons repeat themselves, cluster to cluster.

Information from an article by W6SAI, Jan 1985.

Intruders

The International Amateur Radio Union Monitoring System (IARUMS) is set up to record, report, and encourage the removal of non-amateur stations from amateur band allocations. Stations targeted are usually broadcast or commercial stations from other countries. Priority is not given to local "pirates". Each country appoints a Co-ordinator, who is responsible for collating reports and forwarding them to the appropriate regulatory authorities (DoTC in Australia).

Each WIA Division, apart from VK3, has a Divisional Co-ordinator to collect reports from that Division and forward them to the Federal Intruder Watch Co-ordinator. But the main strength of the service is in the individual amateurs who spend time regularly listening on the bands and identifying types of signals and stations.

More Intruder Watch listeners are always required. Volunteers who contact either their Divisional Co-ordinators or me direct will be supplied with information, log sheets and tapes to assist in identifying modes.

Below is a recently logged list of intruders into the amateur bands:-

Summary of Illegal Intrusions for May 1993

Freq	Date	UTC	Mode	Comments	X
7002.5	200493	1200	A1A	Beacon V nav aid CIS	22
7013.5	2304	1150	R7B	3 X R7B side by side	
7017	0105	2025	xxx	Non amateur data	
7039.5	2004	1135	A1A	F Beacon + N & T CIS	13
7039.5	3004	1124	A1A	B & A Beacon + K CIS	
7039.5	1605	1005	A1A	Beacon H + C CIS	17
7049.5	220493	1211	F7B	UMS CIS	
10102	2404	1140	F2	Bell-like musical note	
14059	0605	0617	A1A	Ltrs only	
14061+	2004	0625	mni	PON,F7B,AC3 CHN	48
14078	1905	0547	AC3	Fax 120 rpm drum sp	
14110	0605	0945	F1B	+F1 cw, idling 4 kHz w +1000 Hz	
14120	1305	0440	F1B	250 Hz shift	
14140.5	150593	1150+	MXD	UMS group A1A, F1B, F1 cw CIS	
14162	1505	0937	F7B		
14170.5	0605	0600+	F1B	+F1 cw 250 Hz 3rd cyr CIS	
14176.5	0105	1000+	F1B	250 Hz+ 3rd register CIS	
14209.5	1305	0857	F1cw	Using Russian cw mxd cyr CIS?	
14210	200493	1045	A3E	H2 of 7105 distorted	
14211.5	0805	1120	F1B	Rtty	
14217.5	2004+	0630+	mxd	F1 cw, A1A, F1B, Mosc nav rad. CIS	
14250	0205	1020+	NON	Jammer 4 kHz wide	
14270	2404	0630	A3E	B/c stn French dialogue	
18106	0305	1051	F1B	RTTY	
18127	2905	0649	F2B	PICCOLO	
18135	010593	1019	A3E	B/c stn music.	
21001	2604	0500+	A1A	Beacon F, navigation aid CIS	
21031.5	2004	0050+	mxd	UMS group B A1A,F1B CIS	20
21104	1905	0601	A1A	P7A Also on 21113 MHz	
21268.5	2105	0545	A1A	Manual morse	
21283.5	2004	0645+	mxd	UMS, A1A, F1B, F1 cw, 250 Hz CIS	13
21285	2804	0845+	A3E	H3 of 7095, Asian prog 10	
21330	2005	1037	A3E	B/c stn talk on Mid East	
21315	260493	0500+	mxd	VVH mni freq used, 21314/445[53]	
24849	0105	0530	A3J	English lang, marine rad tfc	
24942	1605	0543	A1A	JPS Marine shipping tfc	
24947	1305	0200	A3E	Asian lang	
24953	1705	0845	Amtor	Non amateur..or Sitor	
24960	0105	0447	R7B		

24947 This stn has outstations answering but not on same freq's, 947 is the command stn.

Logs this month from VK'S 4AKX, 4BTW, 4BXC, 4AGL, 4JJS, 4BG, 6RO.

* *WIA Federal Intruder Watch Co-Ordinator Freepost No 4 Rubyvale Qld 4702 or VK4KAL@VK4un-1*

A Packet of Packet

*Warren Toomey VK1XWT**

It's early winter as I write this introduction, time to keep inside and build new things (if you have a warm enough shack — I don't!) or to catch up on some reading. So we have a book review this month: the "Hitch-Hiker's Guide to Packet Radio in South Australia" is a wonderful resource guide to packet in VK5. My thanks to Lawrie VK1KLB for letting me borrow his copy.

I also have a short description of the Australian Rose network sent in by Barry VK2AAB, to make up for my lack of knowledge in last month's column.

Thanks Barry.

Warren VK1XWT
VK1XWT@VK1KCM.ACT.AUS.OC
vk1xwt@minnie.vk1xwt.ampr.org

The Rose Network

In last month's packet column Warren noted that he did not know sufficient about Rose to comment. However, as Rose is used in all states except one, many of the readers will have had practical experience with Rose.

But first to explain the name; Rats Open Systems Environment. The Rats is for the Radio Amateur Technological Society which is based in New Jersey USA. The author is Tom Moulton W2VY. Rose is a project of that society and is part of a suite of network programs. Rose as an X.25 network is the only Amateur network protocol based on the International Standard protocols, as determined by CCITT and ISO (International Standards Organisation) and the ISO has registered the amateur network.

Rose is a defined network, ie it does not need to broadcast node lists as the addressing, which is defined by the standard X.121, would enable any station in the world to be connected to by any normal amateur packet station provided the physical links are present. Each switch is told the direction in which each group of addresses is to be found. The addresses are formed by six digits and each Rose switch has its own unique address. The address of VK2RPH has two parts, the Data Network Identifier Code which for Australia is 5050 and the local network address 247600. This latter part is all that local users need to know. This number is in fact the STD code and exchange code for the area where the switch is installed. The Rose network internationally has decided on this method as it is discoverable for any switch in the world if you know the geographic location of the switch. A directory facility to comply with ISO standard X.300 is being prepared.

At present Rose is in operation in 35 countries and preliminary steps are being taken to link the various national and international networks. This will be done by connecting TNC2 Rose switches back to back through other networks. Not radio of course but HF or amateur satellite links are not yet available.

The identification of packets is clear and unambiguous. Application programs enable users to determine what stations are active at remote switches and provide information on network addresses. The X.25 protocol is only used between the switches and the users enter the network with their normal AX.25 stations.Rose can also be used as a carrier for TCP/IP networks.

Enough of the theory. What is the state of Rose in Australia at present? The network has 22 switches installed in New South Wales covering from the Queensland border to the Victorian border at Bega. The main area not covered is the south to south west of the state. The switches in use are a mixture of Paccom DR200s and Tiny 2 TNCs. The switches are linked on a dedicated UHF frequency and each switch has its own separate VHF frequency for its local area network. To achieve this two Tiny 2s are connected back to back on their RS232 connectors, or a DR200 dual port switch is used. Tests have indicated that the DR200 has up to 30% faster throughput than two standard back to back Tiny 2s.

The backbone link frequency operates at 1200 bps which speed has served its purpose of getting a network up and running. There has been criticism of using 1200 bps instead of faster speeds, but these criticisms have generally come from those not involved in actually trying to get a network up over an area many times the size of some other states. 9600 bps full duplex would cost an amount of money that is simply not available. As the financial burden would fall to a large extent on small country clubs with some assistance from the Australian Amateur Packet Radio Association it is just not possible to upgrade the network to 9600 bps full duplex. To put it into perspective, AAPRA has provided equipment assistance for all states to the value of $25,000. To have a 9600 bps full duplex network would require an additional expenditure of approximately $80,000 for NSW alone.

In South Australia a network of six Rose switches is being installed and they are about to upgrade parts of the backbone to 4800 bps. The partially installed network extends from Pt Augusta in the north to Millicent in the south. In North Queensland there are three Rose switches in the Townsville area. Western Australia has either three or four switches, but I am uncertain of the geography of the network. Tasmania has recently installed two additional switches, one in the north and one in the south of the state making, I believe, a total of four. These switches are now in the process of being linked with a separate backbone frequency with two DR200s and one back to back Tiny 2 installation.

Hitch-Hiker's Guide to Packet Radio in South Australia

HITCH-HIKERS GUIDE TO PACKET RADIO IN SOUTH AUSTRALIA
Compiled By Grant Willis VK5ZWI
Typeset by Ashley Kitto VK5YAK
Printed by Peter Cockburn VK5TZX
Sources: F6FBB BBS Help Texts
X.25 Rose Networking User Manual
N6VV, VE3GYQ, W0RLI BBS Address Paper

The "Guide" is a 46-page booklet which describes all you need to know about the current and planned packet services in VK5. It is written in an easy to read style, with sections covering bulletin boards, ROSE and NETROM nodes, special services, and concluding with a "data" section.

Packet Introduction

This section consists of a very basic introduction to how packet radio works and what equipment is required. Places where equipment is available are listed as well as the types of information available. The TNC and TNCless systems for IBM-PCs and Commodore C64s are listed as well as some examples of terminal programs you can use.

BBS Commands

This section introduces the new user to the BBS, starting with the first-time logon sequence, then describing the basic commands through to the special services such as DOS-like operations, online satellite tracking and the local callsign service. It's an excellent thing to have lying around on paper; sometimes when you need help you can't even remember how to ask the BBS for help! Many of the commands have actual

usage examples taken from the local BBS stations.

Connecting to things

South Australia has both a ROSE network and a NETROM network. This section describes how to work your way around the networks, using digipeating, ROSE, NETROM or a combination of the above. Tips and tricks for successful "hitch-hiking" in the ROSE network are also given.

Special Services

The Special Services section covers the RTTY to packet mail gateway in Adelaide: *this service appeals to those who want to stay in a more mechanical age, but still want to send mail to friends.*

Detailed explanation is also given to the Conference Bridge services available and the TCP/IP Networking facilities that are installed in Adelaide. There is also a brief explanation of how the various protocols like ROSE, NET/ROM and TCP/IP function (extracted from the SA Amateur Technical Symposium Proceedings 1993).

Special BBS server facilities such as remote file and database servers are described and how to use the REQSAT system to send mail via the Satellite Gateways.

VK5 Packet Data

The "data" section provides all the information on VK5 packet that you're ever likely to need. I'd bet most of the users have their copy stuck open to this section.

The data provided includes:

- VK5 BBS systems
- VK5 remote PMS systems
- VK5 main digipeaters
- VK5 ROSE nodes
- VK5 main NETROM nodes
- VK5 TCP/IP nodes
- Contact addresses for further information
- Addressing overseas packet mail
- VK5 packet network map
- VK5 VHF/UHF bandplan and Region III HF packet bandplans with frequencies, baud rates and callsigns throughout.

Where to Get It

The "Guide" is an excellent resource for both the new and the experienced user, and this sort of document should be made available to all packet users. Congratulations to the South Coast Amateur Radio Club for a job well done.

If you are interested in a copy of the "Guide', look for announcements in future editions of "Amateur Radio" magazine. The 1st edition has sold out and the 2nd is still in pre-production. SCARC hope to have it ready by the end of September. Cost and contact details will be released once printing is complete.

Miscellaneous

The PCBs for the DSP4 project, described in this column in May, have finally become available. The designers, Jarkko OH2LNS and Kaj OH6EH, are selling the unpopulated four-layer boards for US$40. I am acting as co-ordinator for the VK orders, so if you are interested, please drop me a note. Any new information I get to hand about the project will be passed on to DSP@VKNET on the bulletin system.

I also have the full documentation and source code for the DSP4 project from Jarkko. If you'd like a copy, please post two high-density disks to my address, plus return postage in coins or stamps.

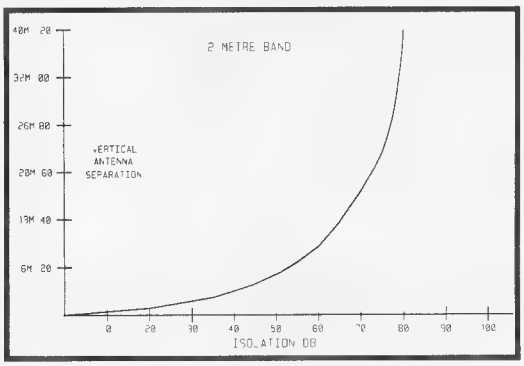
That's it for now. Stay warm and I'll see you in the next packet column.

99 Brigalow st, Lyneham ACT 2602

BT

REPEATER LINK

Will McGhie VK6UU explains the simple option of split antenna design for repeaters.*



When it comes to placing a voice repeater on air and the choice of aerial systems is considered, the simplest option is the split aerial design. Duplexers have their advantages but also a few disadvantages. If you have a tower of 20 metres or more, then separate aerials for receive and transmit can be the easiest way to establish a repeater. It is always possible to change the system to a duplexer design some time in the future.

With the new repeater up and running using separate antennas, valuable experience can be gained without the extra complications that a duplexer imposes. Once your repeater is performing as planned, adding a duplexer to the system can then be compared with the known split aerial design.

The big question with a split aerial design is how much aerial separation is required. There is no precise answer, as the isolation needed between the receive and transmit antennas depends on how well your repeater performs with the transmitter and receiver being so close.

With solid state repeater equipment about 80 dB of isolation is required between the receiver and transmitter port. Valve equipment can require as little as 40 dB of isolation due to lower noise output from the transmitter and better overload performance of the receiver. For this article only solid state equipment is to be considered.

The isolation figures required are about the same for 2 metres and 70 centimetre repeaters. 70 centimetre repeaters require a little less isolation (10 to 20 dB) but in general terms the two bands are the same. The big difference is that less aerial separation is required for the same isolation. Typically only one third of the vertical separation is required on 70 centimetres as compared to 2 metres.

The graph shows vertical aerial separation on a tower to achieve corresponding isolation in dB for the 2 metre band. This isolation figure means that if a 1 Watt transmitter is fed to one aerial, and the power received by the other aerial is 1 μW, then the isolation between the two aerials is 60 dB. This also corresponds to about 10 metres (30 feet) of vertical aerial separation.

As the graph shows, for isolation greater than 60 dB the vertical separation of the antennas increases greatly. To achieve 80 dB of isolation a vertical antenna separation of about 35 metres (110 feet) is required. If you want the lower antenna to be 10 metres above ground level, then the tower has to be 45 metres (140 feet) high.

Single cavity filters can be added to each aerial feed to achieve extra isolation. A full size band pass cavity filter at 600 kHz split will provide an extra 10 dB of isolation. Note that, to achieve this, a cavity filter must be added to each aerial port; that is, equal isolation both ways. You may find that more filters have to be placed in the receive port than the transmit port as the required isolation is not always symmetrical.

A cavity filter configured as a notch filter offers greater isolation than the band pass configured filter. 35 dB can be achieved with notch cavities.

As the graph shows, at 10 metres separation 60 dB of isolation is achieved. With notch cavities in each antenna feed contributing 35 dB of added isolation the total isolation is 95 dB, a workable repeater.

When planning a new repeater don't dismiss the split aerial design as it may be the easiest way to have the repeater on air with a minimum of effort.

** 21 Waterloo Cr Lesmurdie 6076 VK6UU@VK6BBS*

BT

VHF/UHF An Expanding World

*Eric Jamieson VK5LP**

All times are UTC

I'm back in harness again after an unexpected ten weeks stint in hospital. That's what can happen when you develop an allergic reaction to a particular type of dressing, and then it takes a long time to heal. Sorry I had to leave readers stranded for two issues of *Amateur Radio* but there was little I could do about it. Now, of course, I'm really pushed for time trying to sort through almost three months backlog of information, so it has been a task of many hours assembling the August notes.

50 — 54 MHz DX Standings

DXCC Countries based on information received up to 25 June 1993. Crossband totals are those not duplicated by two-way contacts. A callsign cannot be displaced from its existing position except by another with a higher **confirmed** number.

Column 1: 50/52 MHz two-way confirmed contacts

Column 2: 50/52 MHz two-way claimed as worked but not confirmed

Column 3: Crossband 50/52 MHz to 28 MHz confirmed

Column 4: Crossband 50/52 MHz to 28 MHz worked

Column 5: Countries heard on 50/52 MHz

Call sign	1	2	3	4	5
VK4KK	93	93			4
VK3OT	92	92			
VK4BRG	85	87			
VK2QF	83	85			
VK2BA	69	69			
VK4ALM	68	70			
VK4ZAL	68	68			
VK2BBR	54	64			
VK4TL	50	54			
VK8ZLX	45	60		1	
VK3AMK	45	47			
VK6HK	45	47			3
VK8GB	42	42			13
VK5RO	39	48		3	
VK6RO	39	39		1	11
VK1RX	39	39			9
VK5LP	35	36			9
VK3AWY	34	36			
VK3AUI	34	35			
VK3BDL	32	32			
VK3NM	31	34			
VK5BC	29	63			
VK2DDG	25	26		2	13
VK4KHZ	23	34			
VK3XQ	23	25			2
VK6PA	35	57			
VK2KAY	21	23			
VK2BNN	20	21			
VK9LG	20	20			
VK7JG	20	22			2
VK4BJE	19	25			
VK4KAA	19	20			
VK3TU	17	19			
VK2ZRU	16	19			4
VK4ZSH	16	16			
VK2ZSC	16	29			
VK9LE	14	14			
VK3KTO	11	11			
VK6OX	10	10		1	
VK5KL	6	11		1	16
Overseas					
JA2TTO	48	48			6
YJ8RG	25	25			

The next list is planned for the February 1994 issue. Copy, additions or alterations to me by 20 December 1993 please.

It appears various organisations such as ARRL and RSGB are accepting six metre QSLs from Taiwan so there seems little point in me refusing to do so. Anyone other than those listed below, having a QSL with a BV prefix and wishing it to be included in their tally above, are asked to please send me a photocopy of the card. BV is already included in the tally of VK4KK, VK3OT, VK2QF, VK2BBR, VK4TL, VK5BC and VK6PA.

John VK4ZJB has advised me that he has relinquished the callsign **VK4ZJB** and will in future use only **VK4KK.** The alteration has been duly made to the Standings List.

Six metres

A letter from **Bill VK6JQ** at Broome corrects two items I tendered in the March 1993 issue of AR. One — that he did not have the first VK contact with S21ZE, although he heard the station operating as a beacon on 50.115 at 1258 on 8/10/92, he was unable to get anyone to respond to his calls. Earlier, same evening at 1116 on 28.031 MHz he worked S21A. Bill is of the opinion that my information in the January issue is correct in that **VK8RH** was the first VK to work S21ZE.

Two — my advice that on 7/1/93 Ron VK4BRG had worked VK6JQ was incorrect as Bill's transceiver was out of action and awaiting spare parts at that time. It may have been a mistaken call sign. Thank you Bill for advising me of the needed corrections.

Incidentally, Bill VK6JQ uses a TS600 at 12 watts output to a six element long yagi at a height of 12 metres and all contacts are by CW. From 10 April 1985 until 24 February 1993 Bill had worked 45 countries from Broome, all but three since 1989. His contact with TL8MB on 3 April 1991 constitutes the VK6 and Australian long path record at 28397 km. Also, Bill says that Eric TL8MB is now XU5DX from Cambodia and as such has recently been giving a few VKs a new country.

John VK4PU says that March was noted for the almost daily appearance of JAs, a couple of visits from HL9 sometimes accompanied by much strong TV crud and much use of the call frequency by island stations. T20AA gives his manager as N4FJL. The early part of April brought in ZL, T30 and JA beacons.

John VK4TL at Malanda reports much the same results as VK4PU with Asian TV crud prominent amongst the JAs through March and April. On 13/3 at 0615 worked VR6JJ, 27/3 at 0330 T20AA; 27/5 JA2DJL, JA5AFE, JR3IIR, HL9UH and 29/5 JF1CZQ.

Ron VK4BRG sent me a copy of his Packet Bulletin of 11/4 wherein he said April propagation on many days included T20, T30, ZL, KH6 and JA. On 13/3 at 0605 and 14/3 at 0611 Ron worked VR6JJ and copied his beacon on 30/3 and 7/4, each time noting S1 signals from KH6. For what appears to be his only trans-Pacific contact for the equinox, on 19/3 at 2326

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11am to 2pm Monday to Friday
7 to 9pm Wednesday

Ron had a weak CW QSO with N6XQ. If that was all that Ron could manage from his North Queensland location, is it any wonder everything has been quiet in southern climes.

Lloyd VK4FP from the Townsville area says April has been busy with KH6, T30, HL9, JA and BV2 available at good strength. VR6JJ heard twice but too weak to work. Lloyd says he felt frustrated not being able to work XU0 as good signals have prevailed from near areas such as BV2 and V85.

Brian VK4DDC added a brief comment in reply to a letter from me that to 13 April there had been no DX apart from JAs and mid-Pacific areas, so he was contemplating removing his six metre antenna until next cycle, concentrating his activity on the higher bands in the meantime. Removing the antenna seems a bit drastic to me but I suppose it depends upon what available space you have on the tower! Maybe 1296 to Brisbane where such activity is on the increase?

To change from the Queensland scene, **Adam VK3ALM ex VK3YWV** from Dandenong North says in his letter of 11/6 that the equinox was very quiet. On 10/4 at 0214 he worked Jack T30JH on Tarawa for a new country. Jack was only available for about eight minutes and there were no warning indicators of possible propagation.

On 14/5 at 0805 JA7ZMA/b was logged but no JAs. After twenty minutes the beacon disappeared and was replaced by JA2IGY/b and this propagation allowed a contact with JA2BZY at 0833. On 29/5 Adam worked Bob ZL3TY at 0756.

Adam also advised recent reading indicated that the next cycle maximum is expected in the year 2000, only three years after the minimum in 1997. The article also said that the shortest "11 year cycle" was 7.3 years (1829-1837) and the longest was 17.1 years (1788-1805) — his comment was that is a "long time between drinks!"

The April report from **Vince VK2VC** says T30JH was prominent during early April with signals to 5x9 between 0100 and 0300. KH6IAA and NI6E/KH6 not strong and nothing from W etc. Last JA worked was on 14/3. KC6 observed ragchewing with HL9UH!

Nev VK2QF hasn't yet given away Cycle 22 but believes anything important that arrives now will be a bonus. His activity includes 7/3: JA7,8,0; 14/3: BV2DQ, BV2DP; 22/3: JA1,7; 25/3: JA7; 6/4: NI6E/KH6; 7/4: T30JH, JH1WHS; 11/4: JA7,8. Also heard but not worked have been HL, DX1HB/b, ZL, FO3, KG6 and JR6.

Don VK6HK was fortunate to work XU0UN on 12/4 at 0735 when the two-way SSB signals were 3x1, using forward scatter. In advising me of this contact, Don also says that in total 50 countries have been worked from Perth and a further 11 have been listed as heard — the ones missed being BY, JD1, YS, C21, I, VK9 (Norfolk), 4S7, OK, ZC4, ZS9 and EI.

In response to a letter from me I have had a reply from Peter VK1RX who indicates he has worked 39 countries from Canberra, although this year has been quiet. JAs have been worked, also P29JA, HL9UH, FK8GA and there were several good openings to VK6 during January. Some of his time is spent working stations on two metres via aircraft enhancement.

Mongolia QSLs

It appears some amateurs are having trouble obtaining a QSL from JT1. **Tom VK4ZAL** had such trouble until he enlisted the help of the Central Radio Club of Mongolia and club station JT1JA. The following information may assist: Send your QSL to Tom, PO Box 470, Ulanbator-13, Mongolia, Asia — via Japan.

Tom is JT1BY (listed in call book), and he says to send your cards via Japan, not Russia as it appears letters have been lost via Russia during the past two years and also they are having problems with QSLs from Europe. IRCs are not accepted in Mongolia and return postage requires $US1, or $US2 for an "R" letter which I presume means a registered letter, so good luck! If there had been space I would like to have printed the letter from JT1BY as the Mongolian English is interesting!

Two metres

From Brisbane **Rod VK4KZR** writes that *the usual aircraft-scatter contacts between the Brisbane gang and* ***Gordon VK2ZAB*** *in Sydney continue on a regular basis. Gordon's signal has improved since his antenna modifications. Typically the "opening" is about fifteen minutes with signals peaking to 5x5.*

Doug VK4OE has operated from various spots in western Queensland. He made several contacts to Brisbane from St. George and Roma and almost made it to **VK2ZAB** from St. George.

From 2 May Rod commenced a series of meteor scatter tests with **Mike VK2FLR** in Sydney and **Arie VK3AMK** in Werribee, making use of the Eta Aquarids meteor shower. Arie was worked on the first attempt but the more difficult path to Mike required several attempts until a completed contact was made on 4/5 with several ten second bursts observed. Rod is interested in M/S schedules with other stations and awaits your move!

Meteor Showers

Following on from the above, **Emil Pocock W3EP** in the July 1993 issue of QST's *The World Above 50 MHz,* devotes a whole page headed Meteor and Propagation Monitors which includes much valuable information on frequencies to monitor and the use of strip-chart recorders and/or personal computers to provide an automatic way of keeping track of meteor activity.

Emil also devotes three pages to a separate article in the same issue headed *The Perseids Meteor Shower in 1993,* wherein he writes *great surges of meteors punctuated the 1991 and 1992 Perseids shower. These unusual bursts and the recent reappearance of comet Swift-Tuttle suggest that the Perseids will put on an even more spectacular show this August 11-12, perhaps resulting in a rare meteor storm.* Included in the article is a large section devoted to operating procedures.

Emil adds that *based upon the general trends of the two previous years, great meteor bursts could be expected anytime between 1800 Z on August 11 and 0600 Z on August 12. This period includes all four 1991 and 1992 surges, adjusted for 1993 dates and times.*

This issue of AR should be out in time for you to rush and buy a copy of July QST and set up your station to participate in what could be an interesting event. Limit your calls and listening to about 10-15 seconds and try and complete the contact with a particular station — it may take several bursts — rather than chasing others willy-nilly! Call "CQ scatter" and listen in the general direction from which you hope contacts may eventuate. 50, 144 and 432 MHz could be used with SSB considered the best mode of operation.

1296 MHz

Interest has been generated by the appearance of **Rob VK2BBR** on this band. From his station at Lismore Rob has had regular SSB contacts to the Brisbane area with **VK4DH, VK4OE and VK4KZR.** They look expectantly to the north hoping someone further along the coast will exhibit an interest in 1296 MHz.

News from Europe

With his information **Ted Collins G4UPS** sent a note stating that March was their worst month since 1987 for six metres! Many of his contacts for March were via auroral conditions. ZS6 and 7Q7 using TEP to contact Mediterranean countries and LX1SI. SV worked to LU, CX and PY.

Ted says that UK novices now have access to the full allocation of 50.000 to 52.000 MHz from February 1993 instead of from 51.000 MHz.

From time to time Ted supplies quite a lot of information about activation of countries on six metres and I find it difficult to decide whether to include the news because we are so far from the activity. It would be easy to say that there will be no F2 to help VK contact such areas, but then, how sure can we be when taking into account the way six metres can respond, even for short periods. But here goes!

A six metre rig has been shipped to 5R8DG in Madagascar. Murtada 9K2MU is a new station from Kuwait. Steve ZD8LII is active from Ascension Island. ET3DX from Ethiopia was active during April but for how long? Mike CN8CC is active from Morocco. Alex 4X1MH worked his first European contacts on 16/5/93. EA8SIX is a new beacon on 50.075 MHz.

The northern hemisphere summer Es period was well under way in May with contacts to stations using the following prefixes: 4X1, 5B4, 7Q7, 9A2, 9H1, C31, CN8, CT, DL, EH1, EH9, ES5, EV9, F, FC1, I, IS0, LA, OD, OE, OH, OK, OY, OZ, SM, SP, SV, UB5, UC2, YU, ZB0 — that's 31 countries involved, often with many contacts to each area! Surely Europe is the place where you could turn on a VHF rig at any time of the day and there would always be one or more stations to work. I suppose that when the Es peaks there in June, all 50 countries in Europe will have been worked as it seems no country would be further than a double-hop for Es. Fantastic!

Geoff GJ4ICD from Jersey Island reports the summer Es started well with 9 May commencing at 0800 with EH9IB and by 0900 the band was full of activity, with several CN8 stations in Morocco coming right across Europe. At 1028 CT3FT from Madeira rose to 5x9 but the best was to come with reception at 1100 for ten minutes of the FY7 beacon from French Guiana, South America. He queries whether it was ES extended TEP or multi-hop Es. (The distance is about 6000 km or four hops which would be rare for Es....VK5LP). Stations from the Caribbean were audible on 28 MHz at the time.

On 12/5 the MUF climbed sufficiently for 144 MHz to open for contacts between the UK, France and Switzerland to Greece, also CN8ST to HB9QQ. This high MUF provided a set of incredible conditions on six metres so that ES enhanced TEP provided 7Q7JL from Malawi and ZS6s were heard. The good conditions were shared over much of Europe and the band was still alive at 1900.

On 13/5 **Ted G4UPS** worked UC2AA (Belarus — ex Belarussia) for the first ever contact with the UK. Later CT3FT from Madeira Island at S9+ was into **GJ4ICD** for three hours, followed by ZD8VHF/b from Ascension Island and V51VHF/b from Namibia both S9+ via ES plus TEP. The following day JX3DA on Jan Mayen Island heard G3SYC in York. All these operations are over considerable distances and probably for the first time many UK and European operators will experience the pleasures which come from now being able to respond to the TEP mode.

Geoff said that on 19/5 he managed a one minute contact with Fred C31HK from Andorra, who later advised that his May contacts were the first legal operations on 50 MHz from that country, where there are six operators. Other snippets of information from Geoff are:
3V from Tunisia will be on 50 MHz during August at least. SV5 (Dodecanese Is) and 3V9 (Crete) now have six metre permits. The French calling frequency is 50.210 MHz. EH8ACW operates from Canary Island. Hal ZS6WB has recently shipped 50 MHz equipment to C91J in Mozambique and 5R8DG in Madagascar. Geoff said my list of 150 countries worked by UK amateurs (May AR) left out 4S, 8Q, YC, FR/6 and HA so that makes a total of 155 countries! UK 10 GHz information requested has arrived and will be included at a later date.

First worked from Australia

Despite my hospitalisation, this segment has continued to proceed. Before turning off the lights I posted 35 letters to various participants in the listing, asking for details to be checked and some additional information. Most have replied but some remain outstanding and it would assist the final result if I had your replies please.

Closure

Its been a difficult three months for me, but I have "survived" and somehow managed to get these notes together. Perhaps by next month all will be flowing smoothly. Closing with two thoughts for the month: 1. Everybody wants sympathy, but nobody wants people feeling sorry for them, and 2. Too many people confuse bad management with destiny.

73 from The Voice by the Lake.

*PO Box 169 Meningie SA 5264.

When you buy something from one or our advertisers, tell them you read about it in the WIA Amateur Radio Magazine.

Spotlight on SWLing

*Robin L. Harwood VK7RH**

As I was recently browsing in a local newsagency, I came across a booklet entitled "The Dawn Of Australia's Radio Broadcasting" by Philip Geeves and published by Electronics Australia. Naturally, as I have always been fascinated by the early days of radio, I eagerly picked up this 74 page book. It is in a magazine format, and is extremely informative about the early days of radio broadcasting in Australia. The author, Philip Geeves, completed Part 1 of a projected history of Australian Broadcasting, shortly before his death in 1983 and Jim Rowe of "EA" has managed to compile and publish this unfinished manuscript. It is very readable and hopefully others will take on this task and complete the remaining parts of the history of Australia's broadcasting.

This booklet covers the period from the commencement of broadcasting in 1920 to the creation of the Australian Broadcasting Commission on the 1st of July 1932. History records that the first regular radio broadcast commenced on the 2nd of November 1920 in East Pittsburgh, PA at the Westinghouse plant. It was only 50 watts and its call has gone down in history.... KDKA. The first broadcast from KDKA were returns of the US presidential election.

Although the book doesn't mention it there indeed were other radio broadcasts prior to KDKA's commencement, but these were mainly experimental transmissions. For example, I do recollect reading in a school primer the account of the first broadcast of speech over wireless was back in 1906 in Boston MA. The article described the dramatic effect on the "Sparks", when they heard speech coming over the ether. I think it must have been around Christmas as well.

The first public demonstration of radiotelephony in Australia was held at

Victoria's Parliament House. (This building also doubled as the Federal Parliament House, prior to Canberra.) It was in Melbourne on Wednesday 13th of October 1920 at the request of the then Prime Minister, Billy Hughes.

It was worth noting that amateurs played a significant role in the development of broadcasting in Australia. In fact they pioneered the field until the regular commencement of broadcasting stations. The first regular broadcasting station, 2SB, came out of W J Maclardy's experimental station 2HP in Cremorne. Maclardy, besides being a licensed amateur, was also the publisher of "Wireless Weekly".

2SB started out with only 10 watts from the Smith's Weekly offices in Phillip Street. It wasn't too long before a 500 watt transmitter was used. 2SB commenced regular broadcasts on Thursday November 13th 1923 on a frequency of 857 Kilocycles (350 metres). The callsign was altered early in 1924 to 2BL, which is still operational, now on 702 kHz. I hope that this broadcasting milestone won't go unnoticed in November of this year. 70 years is certainly worth celebrating.

A large Sydney retailer, Farmer and Company, contracted AWA to install their station, 2FC, which commenced just a few weeks later on the fifth of December 1923 on 1100 metres (273 Kilocycles).

I was surprised to learn that both 2FC in Sydney and 3LO in Melbourne operated on the longwave band, when they first started. 3LO started on 1720 metres but changed to 808 kilocycles early in 1925. Only the Europeans are today still employing longwave frequencies for broadcasting.

I found this booklet informative yet it neglected the importance of Father Shaw's contribution to the development of radio in Australia. There needs to be a book written about him alone and how he organised a network of coastal stations around Australia. I believe that the ABC had a program on Father Shaw's contribution to the history of radio in Australia. Likewise other radio pioneers aren't mentioned. This booklet is a history of broadcasting and not a general overview of the development of radio. Nevertheless, it is still worth reading and is reasonably priced.

Many international broadcasters have been mentioning that they are now on satellite transponders as well as being on shortwave. The BBC, Deutsche Welle, Swiss Radio International and other mainly European organisations have been available for 12 months via satellite. The main purpose of these services is to feed cable or other rebroadcasting stations. Recently, SRI in Berne caused an outcry by dropping services within Europe on shortwave. They made a false assumption that there are many Europeans with facilities for receiving programs directly from satellite. These broadcasts are usually on a subcarrier of an existing TV transponder.

As it is at present, there are many satellite receivers on television, but few have the facilities to receive these subcarrier signals on radio. SRI estimated that there were 2 million who could receive them but were wide of the mark. The economic cost of these sets is quite high compared to the cost of a shortwave radio. Also, there are some nations where it is illegal to own or use satellite receivers.

The VOA in Washington has stated that direct satellite broadcasting is not likely to generate mass audiences, unless an existing broadcaster relays on cable or terrestrially rebroadcasts the output. As the main audiences on shortwave are in the developing world, where the economic cost of a suitable receiving system will be beyond the reach of all but the wealthy and powerful, shortwave radios are still a powerful force to convey information across international borders.

Well, that is all for this month. Until next time, good listening!

** 52 Connaught Crescent, West Launceston, TAS 7250 or VK7RH@VK7BBS*

Pounding Brass

Due to circumstances beyond our control, we regret that we are unable to publish the "Pounding Brass" column this month.

UPDATE

HFC Regulated Variable Voltage Power Supply

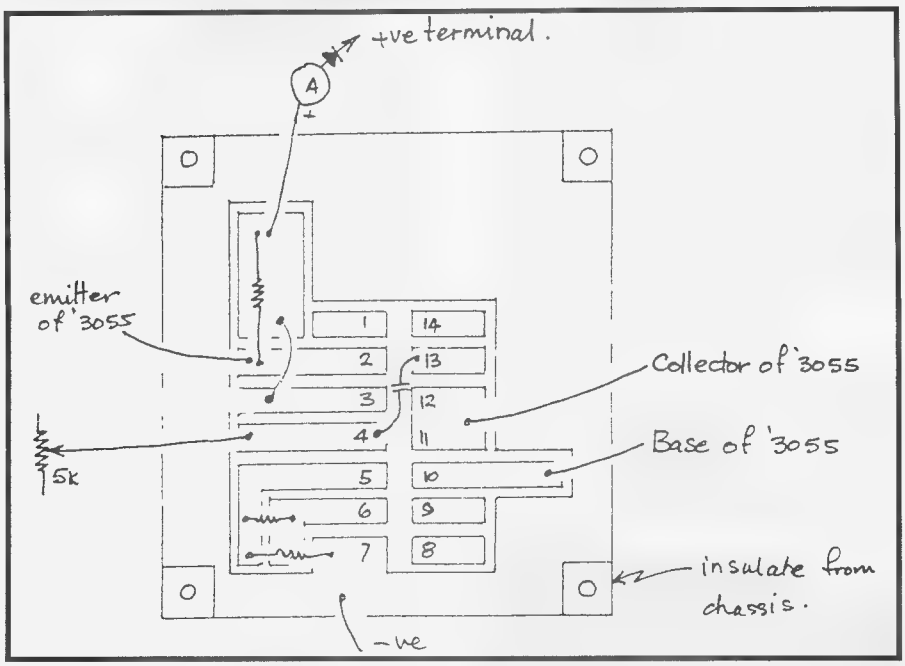


Figure 2 — LM273 Component Location.

Drew Diamond VK3XU has pointed out an error in the "Fig 2 — LM723 Component Locations" diagram on page 21 of the May 1993 issue of *Amateur Radio magazine*. Drew points out that, although the circuit is correct, if the board is wired as shown on the published printed circuit board diagram, the voltage can only be adjusted down to 8 V rather than to 4 V as specified. Note from the new circuit board diagram that the two 1.5 K ohm resistors join together at pin five of the LM723 and not at pin 6 as shown on the board layout in May.

Make sure you alter the board layout on page 21 of your May 1993 copy of *Amateur Radio* magazine now!

WICEN

News from WICEN (NSW) Inc.

The Annual General Meeting of WICEN (NSW) Inc. was held at Amateur Radio House, Parramatta, on Saturday 10th July, with about twenty five people in attendance. This was a disappointing turnout, given that there are several hundred WICEN members in NSW.

Following the formal reports, the result of the nominations for the various positions was announced. As there were sufficient nominations to fill the vacancies, an election was not necessary. The office bearers for 1993-1994 are:

President:	Bill Allen VK2APN
Vice-Presidents:	Brett Wilkinson VK2XMU
	John Buxton VK2GJB
Secretary:	Peter Corkeron VK2AGB
Treasurer:	Annette Wilkinson
Committee:	Simon Clowes VK2CSC
	Neale Imrie VK2CNI
	Alan Whitmore VK2YYJ
	Dave Horsfall VK2KFU
	Brad McMaster VK2KQH

Note that the State Co-ordinator is not elected at the AGM, but is appointed separately; earlier this year John Howard VK2AMH replaced Phil Greentree VK2IW who had resigned.

There was some discussion in General Business such as the difficulty of obtaining a consistent colour on overalls, and whether a different colour ought to be specified; the importance of completing time sheets per VRA requirements and the Assets Register per Charity requirements; and details of the forthcoming events. The meeting finished with a presentation from Brett VK2XMU and Eric VK2KUR on the WICEN (NSW) telephone BBS, accessible on (02) 888 2763 (currently with access on 300/1200/2400 bps, soon to go to 9600/14400 bps). Members are urged to use this BBS, as the more people using it the better it will be.

WICEN (NSW) members are reminded that the last day for renewal is 30th September; after that you will be considered unfinancial.

Two important exercises in August are the Annual City to Surf Fun Run on Sunday 8th August, with Brett VK2XMU in charge; and on the weekend of 14th-15th August is the Batemans Bay Car Rally, organised by Dave VK2BDJ.

Forthcoming WICEN (NSW) events appear on the VK2 BBS; along with general WICEN news they also appear on the national packet radio network, usually addressed as "WICEN @ VKNET"; they can be downloaded from the VK2RWI packet BBS (and probably others) in the "WICEN" files area; members with access to USENET can read them in newsgroups "aus.radio.wicen" and "rec.radio.info"; those with Internet access can obtain them via anonymous FTP from "grivel.une.edu.au" under "pub/ham-radio/aus.radio/WICEN"; and FidoNet users can read them on the "WICEN_General" conference. For the benefit of readers confused by these esoteric terms, an article explaining them is in preparation for a future issue.

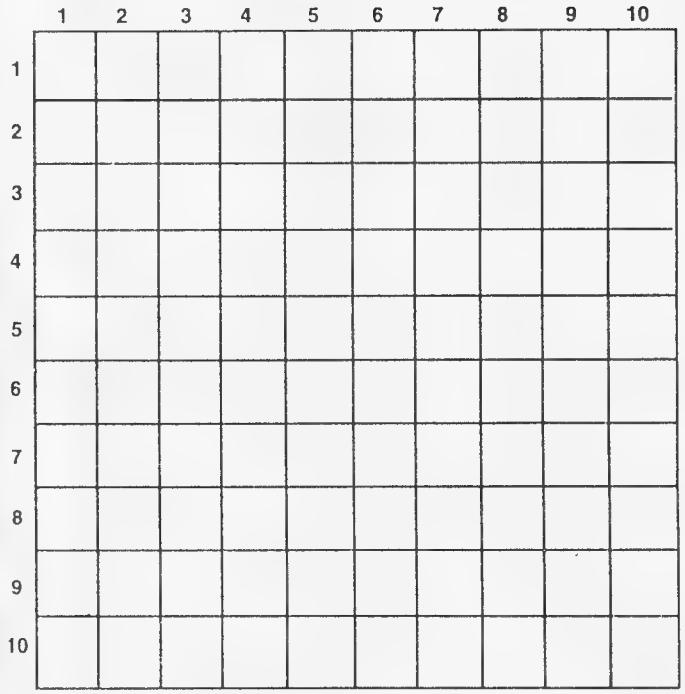
The address of WICEN (NSW) Inc. is PO Box 123, St Leonards 2065. WICEN (NSW) conducts nets at various times; the only one we know about is the Sydney VHF Net every Thursday night at 2130 local time on repeater 7150 in Chatswood.

Dave Horsfall VK2KFU, Publicity Officer, WICEN (NSW) Inc.

Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse of the Amateur Radio address flysheet.

Morseword 77

Solution Page 56



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Across:

1 Irish Pound
2 Public transport
3 Capital of Peru
4 Passenger
5 Sense
6 Squander
7 Annoy
8 Attempted
9 Mothers
10 Little Vivienne

Down

1 Cheek
2 Baby Tom
3 Entitled
4 Sharp Whisper
5 Group of rooms
6 Young Stephen
7 Bakery
8 Christmas
9 Chooks
10 Half a dance?

HF Predictions

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μV in 50 ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used for these calculations is 60.3, while the predicted value for September is 57.2 and for October it is 55.2. **ar**

VK EAST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.8	7	7.7	2	-15	-33	...	...
2	8.6	-2	6.6	-1	-17	-36	..	...
3	8.8	-8	6.8	-1	-15	-31	..	. .
4	11.9	-2	9.3	1	-3	-13	-28	..
5	16.9	4	13.1	0	3	0	-8	-19
6	15.6	4	14.9	0	5	3	-3	-12
7	14.9	4	14.2	0	4	2	-4	-14
8	17.3	4	12.9	2	4	0	-8	-20
9	15.3	5	11.5	4	3	-3	-15	-29
10	13.3	4	10.0	5	0	-9	-25	..
11	11.7	5	8.7	5	-5	-18	-37	..
12	10.5	7	7.7	4	-10	-27	...	. .
13	9.7	13	7.2	3	-16	-36	...	...
14	9.3	19	6.8	2	-21	..	...	...
15	9 1	25	6.7	2	-25	...	...	...
16	9 0	27	6.7	1	-27	. .	..	...
17	8 9	30	6.7	1	-28	...	...	...
18	8.5	31	6.4	-2	-34	...	...	...
19	8.0	31	6.1	-6	...	...	...	...
20	8.5	31	6.5	-2	-34	..	...	...
21	8.5	31	6.5	-3	-35	...	...	...
22	8.1	28	6.3	-6	-39	...	..	...
23	7.8	17	6 1	-8	-38	...	...	...
24	8.2	11	6.5	-4	-30	..	. .	...

VK EAST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.4	10	9.1	10	5	-3	-16	-32
2	12.8	12	8.7	12	4	-6	-21	-39
3	12.1	15	8.3	12	2	-9	-27	...
4	11.6	17	8.0	13	0	-13	-33	...
5	11.5	24	7.9	16	0	-15	-37	...
6	12.3	24	8.6	19	4	-9	-29	...
7	14.5	22	10.1	23	13	2	-14	-31
8	13.8	18	10.5	17	7	-3	-20	-38
9	11.2	10	8.6	9	-1	-13	-31	...
10	10.8	1	8.1	4	-4	-15	-32	...
11	10.2	-7	7.5	1	-5	-15	-32	...
12	9.7	-14	7.1	0	-5	-14	-29	...
13	9.5	-24	7.1	-4	-7	-15	-29	.
14	9.4	...	6.9	-12	-14	-22	-37	. .
15	9.3	...	6.9	-19	-19	-28	...	...
16	8.8	...	6.7	-25	-27	-36	. .	...
17	8.3	...	6.3	-33	-35	...	...	...
18	8.8	...	6.7	-27	-28	-37	...	...
19	10.8	-20	7.9	-5	-4	-9	-19	-33
20	14.2	-6	10.9	-6	-1	-3	-11	-21
21	17.4	1	12.1	-4	2	1	-4	-13
22	16.2	4	11.1	1	4	2	-5	-14
23	15.1	6	10.3	5	5	1	-8	-20
24	14.3	8	9.7	8	6	-1	-12	-26

VK EAST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.8	2	9.7	4	1	-7	-20	-37
2	13 2	-3	9.9	0	0	-5	-17	-31
3	16.6	0	12 4	-5	1	0	-5	-14
4	21.2	4	16 0	-12	1	4	2	-3
5	23.4	3	17 7	-15	0	3	3	-1
6	23.1	3	17.5	-15	0	3	2	-1
7	22.2	3	16.8	-13	0	3	1	-3
8	20.6	3	15.6	-8	2	3	0	-6
9	18.7	4	14.1	-3	4	3	-2	-11
10	16.9	5	12.8	2	5	1	-7	-18
11	15.2	6	11.5	6	4	-2	-13	-28
12	13.9	9	10.5	9	3	-6	-21	-39
13	13.1	14	9.9	12	2	-10	-28	...
14	12.4	19	9.3	14	0	-15	-37	..
15	11.8	24	8.9	15	-3	-21	...	...
16	11.3	26	8.5	14	-6	-26	...	...
17	11.1	28	8.4	14	-8	-29	...	...
18	10.2	29	7.8	9	-16	. .	...	...
19	9 0	30	6.9	1	-29	.	...	...
20	9 3	30	7.2	3	-25	...	...	...
21	12.2	28	9.1	19	0	-19	...	. .
22	13.6	25	10.4	23	9	-4	-23	..
23	12.4	17	9.5	14	2	-10	-30	.
24	14.4	12	11.0	12	7	-1	-14	-30

VK EAST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.5	11	17.9	11	15	14	9	1
2	23.7	11	18.5	9	15	14	9	2
3	23 7	11	18.1	9	15	13	9	2
4	23 9	11	18.2	10	15	14	9	2
5	23.9	11	18.3	12	16	15	10	2
6	23.3	12	17.8	15	18	15	9	1
7	22 0	13	16.9	19	19	15	7	-2
8	20.5	16	15.6	26	21	14	4	-8
9	19.0	20	14.6	32	23	13	-1	-16
10	17.5	21	13 4	32	19	7	-9	-27
11	16.3	23	12.4	30	16	2	-17	-38
12	15.6	23	11.8	29	12	-2	-23	...
13	14.6	24	11.1	26	8	-9	-32	...
14	13.6	25	10.4	22	1	-17	...	...
15	12.7	25	9.7	18	-4	-26	...	...
16	12.2	26	9.3	15	-9	-32	.	...
17	10.9	26	8.4	7	-22	..	..	...
18	9.2	28	7.1	-9	...	.	...	..
19	9.3	28	7 2	-8	...	...	.	...
20	11.7	27	8.9	14	-11	-35	...	...
21	15.6	21	12.2	26	12	0	-19	...
22	21.9	15	16 9	23	21	16	7	-2
23	23.4	13	18.0	18	19	17	10	2
24	23.5	12	18.0	13	17	15	9	1

VK EAST SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.6	24	18.5	33	32	29	23	15
2	24.5	24	18.4	33	33	29	23	15
3	24 4	24	18.4	34	33	30	23	15
4	24 0	25	18.1	36	34	30	23	14
5	23.0	26	17.4	39	35	30	22	12
6	21.4	29	16.2	43	37	30	19	8
7	19.4	32	14.7	44	35	26	14	1
8	17.5	33	13.2	42	31	21	7	-8
9	15.6	35	11.8	40	27	14	-2	-19
10	14.3	37	10.7	37	22	8	-9	-29
11	13 4	38	10.1	35	19	3	-15	-37
12	12 6	39	9.4	33	14	-1	-22	...
13	11.9	40	8.8	30	10	-6	-29	...
14	11.4	40	8.5	28	8	-10	-34	..
15	11.1	41	8.4	27	6	-12	-37	...
16	10.2	42	7.8	22	0	-21	..	...
17	9.0	43	6.9	15	-11	-35	.	...
18	9.3	43	7.2	17	-8	-31	...	...
19	12.3	38	9.6	31	13	-3	-25	...
20	17.1	30	13.2	37	28	18	4	-10
21	21.1	27	16.2	36	32	26	17	6
22	23.2	25	17.7	35	33	29	21	12
23	23.9	24	18.2	34	32	29	22	14
24	24.3	24	18.4	33	32	29	23	14

VK EAST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24 9	28.5
1	23.7	6	17.9	-6	5	7	5	0
2	23.1	8	17.8	1	9	10	6	1
3	20.8	12	16.7	9	13	11	6	-2
4	19.0	15	15.2	18	16	11	3	-7
5	18.0	19	14.3	25	19	12	0	-12
6	17.2	23	13.6	30	21	11	-2	-17
7	16.4	25	13.3	31	20	9	-5	-22
8	15.6	26	12.2	30	18	6	-10	-28
9	14.7	28	11 4	29	15	2	-16	-36
10	13.6	28	10.4	26	11	-4	-24	...
11	12.7	29	9.7	23	6	-10	-32	...
12	12.8	27	9.6	21	3	-14	-38	..
13	12.0	26	9.0	18	-2	-20	...	...
14	11.5	21	8.6	12	-5	-24	...	...
15	11.1	14	8.4	8	-7	-24	. .	...
16	10.1	3	7.7	2	-11	-28	.	...
17	8.8	-9	6.8	-2	-16	-32	..	...
18	9.0	-15	7.0	-2	-12	-26	..	...
19	12.1	-7	9.4	-2	-4	-11	-25	...
20	16.9	0	13.0	-6	0	-1	-8	-17
21	20.7	2	15.9	-11	0	2	0	-6
22	22 6	3	17.3	-14	0	3	1	-3
23	23.1	3	17.6	-14	0	3	2	-2
24	23.4	4	17 8	-11	2	4	3	-1

VK SOUTH AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.1	15	6.9	1	-20	...	...	...
2	9.3	9	7.2	1	-17	-37	...	...
3	12.5	10	9.3	9	0	-13	-31	...
4	17.5	10	13.5	11	10	4	-6	-18
5	19.8	8	16.1	7	9	6	-1	-11
6	20.8	7	16.8	4	9	7	0	-8
7	20.4	6	16.3	4	8	6	0	-10
8	19.3	7	15.3	5	8	4	-3	-13
9	17.7	7	14.0	7	7	2	-7	-20
10	15.8	8	12.4	8	5	-2	-15	-30
11	13.7	8	10.7	8	1	-9	-26	...
12	11.9	10	9.3	7	-5	-19	...	...
13	10.7	14	8.2	6	-12	-30	...	...
14	9.8	20	7.5	3	-20	...	...	...
15	9.4	25	7.2	2	-25	...	...	...
16	9.1	27	6.9	0	-29	..	...	...
17	8.9	29	6.8	-1	-32	...	...	...
18	8.7	30	6 7	-2	-35	...	...	..
19	8.4	30	6.5	-5	-39	...	. .	..
20	8.2	30	6.4	-7	...	...	...	..
21	8.8	30	6.9	-2	-34	...	...	...
22	8.6	30	6.7	-2	-35	...	...	...
23	8.3	28	6.5	-5	-38	...	...	...
24	8.8	21	6.9	-1	-28	..	...	. .

VK SOUTH ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	19.5	8	14.9	7	9	6	-1	-12
2	19.9	8	15 1	5	9	6	-1	-10
3	20.1	8	15 1	5	9	6	0	-10
4	20.0	8	15 1	5	9	6	0	-10
5	19.9	8	15.0	7	10	7	0	-10
6	19.4	9	14.7	9	10	6	-2	-13
7	18.5	10	14 0	12	11	5	-5	-18
8	16 9	13	12 8	17	11	1	-12	-29
9	15 1	19	11 4	21	7	-7	-27	...
10	13 3	21	10.0	17	-2	-22	...	...
11	11.7	22	8.8	9	-16	...	...	...
12	10.6	24	7.9	1	-30	...	...	...
13	9.9	25	7.4	-4	...	...	...	...
14	9.4	25	7 0	-10	...	...	...	...
15	9.2	25	6.8	-13	...	...	...	...
16	9.1	25	6.8	-14	...	...	...	...
17	9 0	25	6.8	-15	...	...	...	...
18	8.5	26	6.5	-23	...	...	...	...
19	7.8	26	6.0	-35	...	...	...	...
20	8.1	26	6 3	-28	...	...	...	...
21	10.3	25	8.0	0	-34	...	...	...
22	13.8	11	10.7	11	-1	-15	-35	...
23	16.9	9	13.0	11	7	0	-12	-28
24	18.7	9	14.3	9	10	5	-4	-16

VK SOUTH EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24 9	28.5
1	12.6	6	8.8	7	1	-7	-21	-39
2	12.0	9	8.4	9	0	-11	-28	. .
3	11.4	13	8.0	10	-2	-15	-35	..
4	11.0	17	7.7	10	-4	-20	...	.
5	10.9	23	7.7	13	-5	-22	...	.
6	11.8	23	8.4	16	0	-15	-38	..
7	13.6	21	9.7	20	8	-4	-21	..
8	13.6	17	10.6	16	5	-7	-25	...
9	11.8	12	9.2	9	-3	-16	-36	. .
10	10.6	4	8.2	4	-7	-21	...	. .
11	9.7	-3	7.5	1	-9	-22	..	...
12	9.3	-11	7 1	0	-8	-20	-39	...
13	9.1	-21	7.1	-3	-10	-20	-38	...
14	8.9	.	6.8	-15	-20	-31	.	...
15	8.8	.	6.8	-25	-29	..	.	...
16	8 4	. .	6.5	-36	. .	.	.	...
17	8 1	...	6.3	...	.	..	...	...
18	8.6	...	6.8	...	.	..	...	..
19	10.2	...	7.7	-23	-20	-27	...	...
20	12.9	-12	10.3	-7	-2	-5	-12	-23
21	15.7	-5	11.8	-9	-1	-2	-8	-16
22	15.4	-3	10.8	-7	0	-1	-7	-16
23	14.3	-1	10.0	-2	1	-2	-10	-22
24	13.4	2	9 3	3	2	-4	-15	-29

VK SOUTH SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28 5
1	18.0	13	13.6	19	13	4	-9	-25
2	18.3	13	13.7	19	14	5	-8	-23
3	18.2	14	13.7	20	14	6	-8	-24
4	18.1	15	13.6	22	15	6	-8	-25
5	17.5	17	13.3	25	15	5	-11	-29
6	15.9	21	12.0	27	13	-1	-21	...
7	14.4	24	10.9	25	7	-10	-34	. .
8	12.8	26	9.6	19	-3	-24	...	...
9	11.3	28	8.5	12	-15	...	...	...
10	10.2	30	7.6	5	-26	...	...	...
11	9.3	31	6.9	-3	...	...	...	...
12	8.7	32	6.5	-9	...	...	...	...
13	8.3	33	6.1	-14	...	...	...	...
14	8.1	33	6.0	-16	...	...	...	...
15	8.1	33	6.0	-17	...	...	...	...
16	7.4	34	5.7	-25	...	...	...	...
17	7.3	34	5.6	-27	...	...	...	...
18	7.1	34	5.5	-31	...	...	...	...
19	7.5	30	5.8	-24	...	...	...	...
20	9.2	21	7 2	-4	-36	...	...	...
21	12.1	17	9 3	10	-8	-28	...	...
22	14.7	15	11.3	16	4	-9	-29	...
23	16.6	14	12.6	18	10	0	-16	-35
24	17.5	13	13 3	18	12	3	-11	-28

VK SOUTH MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.8	9	9.7	9	2	-8	-24	...
2	13.1	1	9.9	3	0	-7	-20	-36
3	16.7	3	13.1	-1	3	1	-6	-15
4	21.5	5	16.4	-8	3	5	3	-2
5	22.4	3	16.8	-12	1	4	2	-2
6	22.3	3	16.7	-13	0	3	1	-3
7	21.7	3	16.3	-13	0	3	1	-4
8	20.6	2	15.4	-10	1	2	0	-6
9	18.7	2	14.1	-5	2	2	-3	-11
10	16.6	3	12.5	0	3	0	-8	-20
11	14.4	3	10.8	3	1	-5	-17	-32
12	12.6	6	9.4	6	-2	-13	-30	...
13	11.3	10	8.4	6	-7	-23	...	...
14	10.5	15	7.8	6	-13	-32	..	...
15	10.0	23	7.4	5	-19	...	..	...
16	9.8	26	7.2	4	-22	...	..	...
17	9.7	28	7.2	4	-23	...	..	...
18	9.7	29	7.3	4	-24	...	..	...
19	9.2	29	7.0	0	-30	...	..	...
20	8.7	29	6.6	-4	-37	...	...	...
21	9.2	29	7.1	0	-30	...	...	...
22	11.3	27	8.8	14	-8	-30	...	...
23	11.2	24	8.6	13	-6	-25	...	...
24	14.7	18	11.3	19	11	0	-14	-32

VK SOUTH USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.0	6	17.8	-5	5	7	5	0
2	22.9	9	17.1	4	11	10	7	0
3	22.2	13	17.0	13	16	14	8	1
4	20.2	17	16.1	21	20	15	7	-2
5	19.1	20	15.2	28	23	16	5	-6
6	18.4	23	14.3	32	24	15	3	-11
7	17.0	23	12.7	31	19	8	-7	-24
8	14.7	25	11.0	27	12	-2	-21	...
9	12.9	27	9.6	21	3	-14	-38	...
10	11.5	28	8.5	16	-5	-26	...	...
11	10.8	29	7.9	12	-12	-34	...	...
12	10.2	29	7.5	9	-16	...	...	...
13	10.0	28	7.5	7	-18	...	...	..
14	9.9	20	7.4	5	-17	-39	..	...
15	9.9	12	7.4	3	-15	-34	..	..
16	9.4	1	7.1	0	-15	-32	...	..
17	8.8	-9	6.7	-2	-15	-31	. .	...
18	9.2	-13	7.1	-1	-10	-23	...	..
19	11.5	-9	8.4	-2	-4	-12	-26	...
20	15.3	-2	11.7	-5	0	-3	-11	-22
21	18.7	1	14.3	-9	0	1	-3	-11
22	21.0	2	16.0	-12	0	2	0	-5
23	22.2	3	16.8	-12	0	3	2	-3
24	22.7	4	17.1	-10	2	5	3	-1

VK WEST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	8.7	21	6.7	-1	-29	...	...	...
2	8.9	13	6.9	0	-22	...	...	...
3	12.2	12	9.1	9	-2	-16	-36	...
4	17.3	11	13.4	12	9	3	-8	-21
5	20.1	8	15.3	8	10	7	-1	-11
6	20.8	7	15.6	5	9	6	0	-9
7	20.7	6	15.5	4	8	6	0	-10
8	20 2	6	15.1	4	8	5	-2	-11
9	19.1	6	14.3	5	7	4	-4	-15
10	17 4	8	13.1	8	7	1	-9	-22
11	15 4	9	11.6	10	5	-3	-17	-34
12	13.4	11	10.0	10	0	-11	-30	...
13	11.7	15	8.7	9	-6	-22	...	..
14	10.5	20	7.8	7	-14	-35	...	...
15	9.8	25	7.2	5	-21	...	...	...
16	9.3	28	6.9	2	-26	...	...	...
17	9.1	30	6.8	1	-29	...	...	...
18	9 0	31	6.7	1	-30	...	...	...
19	9 0	31	6.7	0	-31	...	...	...
20	8 6	32	6.5	-3	-36	...	...	...
21	8 1	32	6.2	-7	..	...	...	...
22	8.6	32	6.6	-3	-36	...	...	...
23	9.0	31	6.8	1	-30	...	...	...
24	8.3	30	6.4	-4	-38	...	...	...

VK WEST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.5	12	17.3	14	17	14	8	-1
2	22.9	11	17.5	12	15	14	8	0
3	23.1	11	17.5	10	15	13	8	0
4	23.3	11	18.1	10	15	13	8	1
5	23.3	11	17.6	10	15	14	8	1
6	23.3	12	17.7	12	16	14	9	1
7	23.1	12	17.6	15	18	15	9	1
8	22.3	13	17.0	19	19	15	8	-1
9	20.9	15	15.9	24	21	15	5	-6
10	19.2	19	14.5	30	22	12	-1	-16
11	17.5	20	13.4	29	18	6	-10	-28
12	15.9	21	12.1	27	12	-2	-22	...
13	14.7	22	11.2	24	6	-10	-34	...
14	13.9	23	10.5	22	2	-17	...	...
15	13.1	24	9.9	18	-4	-25	...	...
16	12.3	24	9.4	14	-11	-35	...	...
17	11.7	24	8.9	10	-18	...	...	...
18	11.3	25	8.6	7	-22	...	...	...
19	10.3	25	7.9	-1	-36	...	...	...
20	8.9	26	6.9	-18	...	...	...	...
21	9.1	26	7.1	-15	. .	...	...	...
22	12.2	20	9.2	11	-11	-34	...	...
23	17.1	14	13.2	18	11	2	-12	-29
24	20.8	13	16.1	17	17	12	3	-7

VK WEST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.2	-4	8.6	-1	-3	-9	-22	-37
2	11.6	-1	8.2	1	-4	-13	-27	...
3	11.0	1	7.8	3	-5	-16	-34	...
4	10.6	4	7.6	3	-7	-20	-39	..
5	10.6	8	7.6	5	-7	-21	...	...
6	11.4	11	8.2	8	-4	-17	-36	...
7	13.1	13	9.5	12	3	-8	-24	...
8	15.2	14	11.0	15	9	0	-12	-27
9	15.4	11	12.2	13	6	-2	-15	-31
10	13.4	7	10.4	7	0	-9	-24	...
11	11.7	0	9.0	2	-5	-15	-31	...
12	10.4	-8	8.0	-1	-8	-18	-34	...
13	9.6	-16	7.3	-3	-8	-18	-33	...
14	9.2	-33	7.0	-11	-15	-25	...	...
15	8.9	...	7.0	-23	-26	-36	...	...
16	8.8	...	6.7	-32	-34	...	...	. .
17	8.7	...	6.6	...	..	...	...	...
18	8.3	...	6.4	.	...	...	...	...
19	8.0	...	6.2	.	...	...	...	...
20	8.4	...	6.6	..	...	..	...	...
21	10.1	...	7.6	-21	-20	-26	...	...
22	12.8	-13	10.2	-8	-4	-7	-16	-27
23	13.9	-9	9.8	-8	-3	-5	-13	-23
24	13.0	-7	9.1	-4	-2	-7	-17	-29

VK WEST SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.5	10	16.3	13	14	10	3	-7
2	22.0	10	16.6	13	14	11	4	-5
3	22.3	10	17.2	13	15	12	5	-4
4	22.3	11	16.7	15	16	13	5	-4
5	22.1	12	16.6	19	18	14	6	-4
6	20.8	15	15.7	24	20	14	4	-8
7	18.9	18	14.3	29	20	11	-1	-16
8	17.0	22	12.8	30	18	7	-9	-28
9	14.9	25	11.2	27	12	-2	-23	.
10	13.1	27	9.8	23	4	-13	-38	..
11	11.7	30	8.8	18	-3	-24	.	..
12	11.0	31	8.2	15	-9	-32	. .	.
13	10.4	31	7.7	12	-14	-39	...	..
14	9.9	32	7.3	9	-19	...	..	..
15	9.7	32	7.3	7	-21	...	.	...
16	9.7	32	7.2	7	-21	..	...	...
17	8.8	34	6.7	1	-30	. .	..	.
18	8.8	34	6.7	0	-31	...	..	..
19	8.6	32	6.6	-1	-34	...	..	..
20	9.1	22	7.0	1	-25	...	...	..
21	11.3	17	8.3	10	-7	-26	...	..
22	14.8	14	11.4	15	6	-4	-21	..
23	18.1	12	13.9	15	12	5	-6	-20
24	20.3	11	15.5	14	14	9	0	-11

VK WEST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.8	16	9.0	11	-3	-19	...	...
2	12.1	6	9.1	6	-3	-15	-33	...
3	15.3	5	12.1	4	3	-2	-13	-27
4	19.6	5	14.9	-1	5	4	0	-8
5	21.0	4	16.4	-5	4	4	0	-7
6	21.0	3	15.8	-7	2	3	0	-7
7	20.9	3	15.8	-8	2	3	0	-7
8	20.6	3	15 5	-7	2	2	-1	-8
9	19.7	3	14.9	-5	2	2	-3	-11
10	18.1	3	13.7	-1	3	1	-6	-16
11	16.3	4	12.3	3	3	-2	-12	-25
12	14.5	7	11.0	7	2	-7	-21	-39
13	12.9	10	9.7	9	-2	-15	-35	..
14	11.7	15	8.8	9	-7	-25	...	...
15	11.1	22	8.3	9	-13	-34	..	...
16	10.5	24	7.9	7	-18	.	...	...
17	10.1	26	7.7	5	-23	.	.	...
18	9.9	28	7.5	3	-25	. .	.	...
19	9.8	28	7.4	2	-27	...	. .	...
20	9.1	28	6.9	-3	-36	...	. .	...
21	8.2	29	6.3	-12	...	...	...	...
22	8.6	29	6.6	-8	...	..	.	...
23	11.0	27	8.2	10	-14	-38	..	...
24	11.3	25	8.7	13	-7	-27	...	..

VK WEST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.9	4	16.6	-13	1	4	3	-1
2	22.3	7	16.8	-7	4	7	5	0
3	20.6	9	16.5	0	8	9	6	0
4	18.8	11	15.0	7	11	9	3	-5
5	17.7	15	14.0	14	14	10	1	-9
6	16.9	19	13.4	21	17	10	0	-13
7	16.0	23	13.0	26	18	9	-4	-19
8	15.3	27	12.0	30	19	8	-7	-25
9	14.5	29	11.2	29	17	4	-13	-32
10	13.4	30	10.3	28	13	-1	-20	...
11	12.6	29	9.4	23	5	-12	-36	..
12	11.3	30	8.4	18	-3	-24	.	.
13	10.6	30	7.9	14	-9	-31	.	..
14	10.1	23	7.5	9	-11	-33	..	. .
15	9.9	15	7.5	7	-11	-30	.	. .
16	9.9	6	7.4	5	-9	-25	...	...
17	9.9	0	7.4	3	-7	-21	. .	...
18	9.4	-9	7.1	1	-7	-19	-39	. .
19	8.7	-18	6.7	1	-6	-18	-37	..
20	9.2	-25	7.1	-2	-7	-17	-34	...
21	11.5	-13	8.5	-2	-1	-6	-18	-32
22	15.3	-4	11.8	-8	0	-1	-7	-16
23	18 7	0	14.4	-13	0	1	-1	-7
24	20 9	2	15.9	-15	0	3	1	-3

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

● HAWAIIAN HAM desires home swap early 1994 with Australian ham. KH6SQ PO Box 351 Pukalani (Maui) HI USA 96788. Non-smokers only please!

● MONSTER CLEARANCE: Connectors at bargain basement prices *UHF connectors:* Connector UHF Cable plug solder RG213 PD259 80c ea (1-9) 65c ea (10 up); Connector UHF cable plug crimp RG58 PD239 80c ea (1-9) 65c ea (10 up); *N connectors* limited stock Andrew Type 44ASW (for Heliax coaxial cable) N male connector 100 % brass, with all accessories including heatshrink sleeve suitable for half inch cable — 80 % off retail: Pay only $17.00 ea; connector N type RG213 male crimp PD9090 $1.90 ea (1-9) $1.50 ea (10 up); connector N type RG62 male crimp $1.90 ea (1-9) $1.50 ea (10 up); adaptor N type female — female in line PD9041 $1.90 ea (1-9) $1.50 ea (10 up); *Capacitors electrolytic: Sprague USA* 75 VDC 99,000 μF +95 degrees C, Height 215 mm, Diameter 75 mm, 3 for $60.00. Please allow for postage and packing. Jim Rogers, 11 Montreal Avenue, Killara, NSW, 2071. Ph (02) 418 1265 Fax (02)498 4466.

● ACCOUNTING SOFTWARE designed by Banking professionals, suitable for Small Businesses, Clubs, Membership Societies, and personal applications. Easy to operate, no special skills required. Financial reports include Cashbook, Profit/Loss, Balance Sheet, General Ledger, and Bank Reconciliation. User amendable Chart of Accounts built-in. Includes manual and on-line support, $265-00. Standalone Invoices module, $240-00. Fully Integrated system of Accounting with Accounts Receivable and Payable, $535-00. General business services, Hardware, LANS etc at competitive prices. 5% discount off all software for AR readers who quote this advert. Samples and demo disks ($10-00, refundable on sale) available.

BOOKMATE COMPUTER SERVICES PTY LTD, 6 Ann Court, Aspendale Vic 3195 (03) 580 6424 Fax (03) 580 8380 (VK3UV) A.C.N. 005 420 548.

FOR SALE ACT

● YAESU FL2100Z with balanced pair new tubes not yet installed s/n IN080418 $1250; ALSO vintage tubes 805, 808, 809 810. Don VK1DH (06) 248 9885.

FOR SALE NSW

● HTX-100 10m mobile xcvr s/n 95000049 exc condn $200. Will consider swap. Rick VK2XRB QTHR.

● ROBOT 400 $380; TELEREADER CWR-685A (updated software) $550; TNC 200 packet radio board $180; SONY ICF-2001 general coverage Rx $240; OLIVETTI M-24 computer $300; ICOM IC-22S $150. Tom VK2OE (046) 21 2228 evenings.

● COMPLETE Oscilloscope home-made, Tube DG7-6, shield, circuit to be picked up $140. Hans VK2AOU (02) 53 9789.

● KENWOOD TS680S HF + 6m in original packing with manual, leads, and (unused) mobile mounting bracket kit, has had minimal use, as new, $1550; MATCHING KENWOOD AT250 automatic tuning unit, good condn, $450; UNIDEN HR2510 25w/10m mobile in original packing with service manual, as new $370. Can ship interstate if necessary. Brad VK2KQH day/early evening (02) 906 5855, a.h. 018 64 0377.

● MORSE CODE trainer programs for C64 free. Send disk postage and packaging. Karol VK2BQQ (02) 957 6808.

● COMPUTERS for packet, IBM-XT turbo 20Mb disk CGA card IBM RAM $175; APPLE 2 plus cp/m starcard $175; ALSO Realistic HTX-100 CW/SSB 10m transceiver $200. Doug VK2KIQ QTHR (02) 587 4989.

● TOWER WINDUP 55ft 2x25 & tube, base pivoted. Hf cubical quad parts, boom, cast and machined spreader clamps, metal reinforced cane spreaders, balun, no wires or rotator $230 ONO. Arthur VK2IK QTHR (02) 876 1465.

● YAESU FT757GX HF AM-FM-SSB C/w Mic handbook and copy of Service Manual. SWR meter auto keyer inbuilt. $985 ONO. Alex VK2DV QTHR (065) 83 7095.

● CRO Double beam Philips PM3230 10 Meg with H/book $300 ONO.Will swap for 2 MX Synth base rig. CRO available for inspection Melbourne. Phone Don VK2BDU (058) 81 1267.

● YAESU FRG7700 Rx GC $300.00. YAESU FC700 ATU six months old $225. 12 V 20 A PS homebrew $200. ELECTRONIC KEYER with inbuilt PS $70. All equipment in excellent condition. Noel VK2BCA (047)39 6255 between 5pm and 9pm only.

FOR SALE VIC

● YAESU FT-ONE, HF all band xcvr, mint condn, DC cables, MD-1 mike, manuals, $1500; HEATHKIT HD1410 iambic keyer, exc condn, manual, $100. Noel VK3FM QTHR

● BENCHER Iambic paddle with shielded lead and plug for direct keying to any of the modern tranceivers,as new condn $95. Roth VK3BG (03) 725 3550.

● ALINCO VHF RF Pwr amp exc condn $120, DTMF decoder board $130, VHF Rx Valves $3 ea and transit $10 ea, Apple 128K ram card $80, IBM XT disk controller card $40, XT IBM motherboards $40 ea, AWA VHF carphone $25. Vincent VK3AJO (03) 872 3503.

● KENWOOD transceiver TS440S s/n 8050449 $1825; KENWOOD power supply PS50 30amp s/n 8060195 $400; DENTRON GLA1000 400w linear $475; ICOM SP2 external speaker $50; SHURE 444D desk microphone $75. John VK3BIL (03) 762 2119.

● SHURE 444D base microphone original manuals and box pc $100; KENWOOD MC-50 pc manuals $85. Paul VK3EPD (059) 83 1771.

● FT101 CW filter 1.8MHz 10MHz spare finals $500; FV-707DM remote vfo $250. Ron VK3AEO (03) 707 3405.

● YAESU FT1000 HF trans compl with b/pass filter unit mic h/book, as new condn $4200 (consider part trade on HF transceiver); COLLINS 30 S.I. linear amp exc condn $2500. Rob VK3JE (060) 37 1262.

● ICOM IC 701 HF Xcvr 100 watt with 701 PSU complete with all leads and manuals. VGC. Serial No 03901 $675. Allan VK3QL (03)754 7943

FOR SALE QLD

● COLLINS Transceiver latest current model KW380 all amateur bands HF on tx full coverage HF on Rx mint condn remote control accessory $2500; ALPHA Linear model PA77SX s/n2894 USA export model exc condn all amateur bands HF $6000, licenced amateurs only. Theo VK4MU QTHR (07) 263 4041.

● KENWOOD TS-520S txcvr 1.8-30 MHz 200 watts pep with mike little use original carton plus manual no mods PC lic amateurs only $500. Trevor VK4ARB QTHR.

● DECEASED ESTATE. Written offers are invited from licenced radio amateurs for the purchase of the following KENWOOD equipment. It has been well cared for and is in original packaging with manuals, cables and accessories excepting the rotator motor which will be properly packed for despatch. TRANSCEIVER TS440S s/n 7051835; POWER supply PS430

s/n 3050189; COMMUNICATIONS loudspeaker SP230 s/n 1020248; KENROTOR KR800S s/n MS87-11. Offers from licenced amateurs to VK4BBL QTHR by 31st August please, as agent.

● PHILIPS FM320 mic ant transwest pwr supply; MIDLAND HF 27 meg t/c, mic, stand, vert ant coax etc. Mobile or Base rig. Accept reasonable price. H. Harmer VK5AUS QTHR (08) 344 5011.

● EIMAC 4CX250BC Premium grade tubes. Brand new $25 ea. AMPEREX 4CX350A tubes brand new also $25 each. David VK4DH (07)274 2155 B/H, (07 378 9869 A/H.

FOR SALE SA

● HOUSE and vacant block suitable for amateur Mt. Gambier P.O.A.
John VK5JT (087) 25 6170.

● ICOM IC-725 Hf SSB/FM/AM txcvr s/n 02174 $1100; ICOM IC-271A 2m m/mode txcvr 25w s/n 27402137 $1000. Both in exc condn c/w manuals orig packing mic etc. Terry QTHR VK5ATW (088) 63 1268.

● PHILIPS FM320 mic ant transwest pwr supply. MIDLAND HF 27 meg T/c. Mic. Stand. Vert ant coax etc. Mobile or base rig. Accept reasonable price. H C Harmer QTHR (08) 344 5011.

FOR SALE TAS

● KENWOOD TS530S HF xcvr s/n 11201024 c/w hand mic instr manual orig pkg exc condn $600. Mike VK7ME QTHR (004) 38 1217. Licenced amateurs only.

● ALINCO DJFIT Micro sized 2 metre H/held inc leather case, new. Rec. 118 — 174 MHz Xmit Ham bands DTMF Tones $450. YAESU FRV7700 VHF Conv 110 — 184 MHz 50 MHz suit FRG 7700 $135. Allen VK7AN (003) 31 7914.

WANTED ACT

● HF COMM Rx any fixable condition by budding Novice for Morse practice VK1PG (06) 248 8884.

WANTED NSW

● COLLINS 62S-1 transverter, Collins SM-1, SM-2 or MM-1 microphone, Collins 32-S1 transmitter, 516F-2 psu, good quality valve tester. Tom VK2OE (046) 21 2228 evenings.

● YAESU FT707 with power supply or similar portable rig in good condition. Kevin VK2BJK QTHR (02) 449 1598.

● HY-GAIN TH3 junior has to be in A1 condition or still in box. Peter VK2FFA (043) 24 4160.

WANTED VIC

● FM-430 FM option for TS-430S. Paul VK3EPD (059) 83 1771.

● BOOK, Meters and Scopes by R J Traister, or Electronic Test Equipment Handbook by Steve Money, or a handbook that describes how to use test equipment. Not too technical. Reasonable price. Allan VK3QL (03) 754 7943.

WANTED QLD

● FDK MULT-800D circuit or manual to repair this 2m FM xcver as the importers have nothing, YAESU FT-ONE data, Mitsubishi I.C.S or replacements MN9005 CPU, MN1201A and MN1203 RAM, MB8718M pll. Dennis VK4ADY QTHR expenses paid phone first (074) 65 2226.

● SK620, SK630 sockets 3CX800A7 valve and socket. 1000D 200 — 500 MHz or 1000C 100 — 250 MHz. Bird 43 inserts. David VK4DH (07) 378 9868 A/H, (07) 274 2155 B/H.

WANTED SA

● TWO EM34 valves for restoration project all expenses met. Kurt VK5KI QTHR (08) 264 1902.

WANTED WA

● EIMAC 3-500z valves (pair), preferably as new; also KENWOOD PS-30
DC power supply, to suit TS130S. Steve VK6VZ QTHR (09) 349 9703.

MISCELLANEOUS

● PLEASE SEND your donation of QSL cards, old or new, to the Hon Curator of WIA QSL Collection, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350. Let us save something for the future.

ar

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300,
Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

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It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:
Industrial Printing, 122 Dover Street, Richmond, 3121. Telephone: 428 2958

MAIL DISTRIBUTION:
R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. $4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

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HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

.....

State and Postcode:.....

WIA Morse Practice Transmissions

VK2BWI Nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3COD Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz

VK3RCW Continuous on 144.975 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 1000 UTC on 3535 kHz

VK4AV Thursday at 0930 UTC on 3535 kHz

VK4WIS Sunday at 0930 UTC on 3535 kHz

VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6RAP Nightly at 2000 local on 146.700 MHz

VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555 MHz

Solution to Morseword 77

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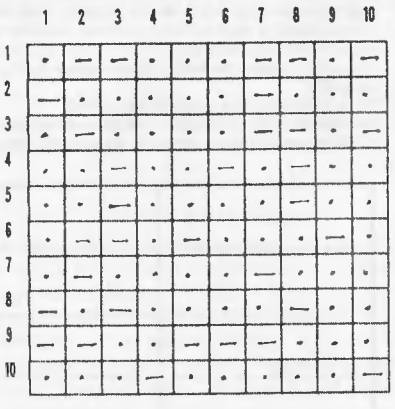

Solution to Morseword 77
Across: 1 Punt; 2 Bus; 3 Lima; 4 Fare; 5 Feel; 6 Waste; 7 Rile; 8 Tried; 9 Mums; 10 Viv.
Down: 1 Lip; 2 Kitten; 3 Named; 4 Hist; 5 Suite; 6 Steve; 7 Oven; 8 Noel; 9 Hens; 10 Cha.

Simplicity.

Why complicate your life when the simple things work so well? The new FT-26 from Yaesu is an excellent example of an easy to use, comfortable to hold, yet highly functional 2m handheld which you'll love to own. The specially designed Australian version microprocessor provides all the specialised features you'll ever need, yet keeps many 'set and forget' functions in the background where they belong. What's more, well laid out controls, rugged polycarbonate and diecast casings and a low distortion speaker ensures you'll enjoy using your FT-26 for many years to come.

- 144-148MHz transceive operation (better than 0.158uV sensitivity, 2W RF output), with highly sensitive wideband receiver coverage (130-174MHz) as standard!
- Custom microprocessor provides Australian version Auto Repeater Shift (ARS) for the easiest repeater operation, plus 53 tunable memories and 6 selectable tuning steps.
- A concise instruction manual with photographs and diagrams which takes you through all areas of operation.
- Each FT-26 comes with a superb long-life 7.2V 700mA/H NiCad pack as standard!
- An external DC jack and inbuilt battery charge circuit allows direct 12V DC operation, and 5W output.
- Yaesu's unique Automatic Battery Saver monitors operating history and optimises the save duration to stretch your operation time.
- 3 selectable output power levels (4 on 12V) provide greater flexibility
- Inbuilt VOX circuitry allows hands free operation (with optional YH-2 headset)
- Inbuilt DTMF paging provides group or selective calling facilities
- Rubber gasket seals provide protection from the elements
- Backlit 6 digit LCD screen and illuminated front panel buttons for night time operation
- Complete with 700mA/H NiCad, beltclip, protective carry case, a carry strap, antenna and approved AC charger.
- Ultra Compact: 55(w) x 125(h) x 33(d)mm.

2 YEAR WARRANTY

A simply brilliant price

$449

Cat D-3600

YAESU

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DICK SMITH ELECTRONICS

VOL 61, NO 8, AUGUST 1993

ICOM

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